The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XI. No. 268 AUGUST 2, 1924 Prepaid Annual Subscription United Kingdom, £1.1.0; Abroad, £1.6.0.

Contents

	PAGE
EDITORIAL NOTES: The Problem of the Organic Chemist; The British Association Meeting; Static Electricity Dangers; Advertising Chemistry; British and German Chemistry	111
Electrolytic Caustic Soda and Solvay Processes—II. By P. Parrish, A.I.C., M.I.Chem.E.	114
CORRESPONDENCE: The Analysis of Brass and Gun Metal	117
Silicate of Soda and Concrete	118
Chemical Matters in Parliament	119
From Week to Week	120
References to Current Literature	121
Patent Literature	122
Market Reports and Current Prices	125
Company News	129
Commercial Intelligence. New Companies Registered. Chemical Trade Inquiries	130

NOTICES.—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to* THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.

Editorial and General Offices*—8, *Bouverie St., London, E.C.4.
Telegrams: "Allangas, Fleet, London." Telephone: City 9852 (6 lines).

The Problem of the Organic Chemist

MORE than three thousand papers are published every year dealing with the preparation, description, properties and reactions of organic compounds alone. Not all of these, it must be admitted, are genuine contributions to knowledge, but the publication committees of the various societies exercise an increasingly rigorous censorship on the papers submitted to them, so that the proportion of useless matter actually printed is now quite small. In addition to articles in the various journals there is the voluminous patent literature to be considered. In Germany alone the number of organic chemical patents granted averages 200 each year, and although the field here is less rich in original discoveries it is still too important to be neglected. How is the organic chemist to keep pace with the development of the science of to-day? And—still more bewildering problem—how will the next generation of organic chemists fare? Specialisation is a partial solution, but it is at best unsatisfactory. The specialist in any branch of organic chemistry is primarily a specialist because he has assimilated and can utilise a large proportion of the knowledge belonging to that particular branch. In any other branch he would in a short time be equally useful if he had easy access to its accumulated knowledge, for the type of brain required in all branches of the subject is much the same. A dyestuff chemist, for instance, easily becomes a specialist in fine chemicals, in explosives, in essential oils; and conversely.

The access to accumulated knowledge can only be gained through really trustworthy text-books and books of reference—books which have been compiled by authors who fully appreciate the responsibility of the task they are undertaking. The text-book serves as an introduction to the subject, and its author necessarily limits himself to useful illustrative facts. In the reference-book, on the other hand, every proved fact must find a place. The new *Beilstein* now in course of publication is probably the last book of its type which will ever be published, and this will be complete only to the end of 1910. Later information must be hunted up in the original papers, to which Stelzner's *Literatur-Register* provides a complete formula index in biennial or triennial volumes. The well-known Meyer-Jacobson is in text-book form, though practically complete references are given. Many will agree that what is now wanted is a series of self-contained monographs of the reference-book type, but each sufficiently limited in scope to make possible fairly rapid publication and appropriately frequent revision. The detailed descriptions of compounds and elaboration of theories which were possible in the days of the older reference-books may now very properly be left buried in the original papers, provided that our monographs say where they are to be found. The monographs we have in mind should be, in fact, bibliographies *de luxe*, and their first essential is that they should be complete.

An interesting departure on these lines is being made by Ernest Benn, Ltd., who will very shortly publish a book by Mr. Cecil Hollins, of the British Dyestuffs Corporation, on *The Synthesis of Nitrogen Ring Compounds containing a Single Hetero-atom*. Here all the methods available for the synthesis of every type of ring with one hetero-atom (nitrogen) are collected and arranged in logical order. The chapters are not only illustrated copiously with formulæ showing the type of method and its variants, but complete references are given to all the compounds prepared by each method. The book thus provides answers to such questions as: What methods are available for the synthesis of a given type of substance? and, What compounds of this type have been prepared? The greater part of the book is occupied with the very important pyrroles, indoles and indigos, pyridines, quinolines, iso-quinolines, acridines and phenanthridines, and it will amaze many chemists to see what a variety of routes are possible even to such simple ring structures as, for example, pyrroles. A glance at the material which Mr. Hollins has included in his volume leaves the impression that the complete state to which he has brought his work must have cost him several years of intense study; and his readers will unhesitatingly agree that he has produced a book which is unique in our chemical literature.

The British Association Meeting

THE meeting of the British Association for the Advancement of Science—the ninety-fourth year—which is being held at Toronto from August 6 to 13, will be at least equal if it does not surpass previous meetings in the quality of the material presented in the papers, while those responsible for the organisation in Toronto can undoubtedly be depended upon to make everything entirely successful. The President this year will be Major-General Sir David Bruce, K.C.B., F.R.S., whose address will deal with the "Prevention of Disease," and the president of the Chemistry Section is to be Sir Robert Robertson, F.R.S., who will deal in his address with the subject of "Chemistry and the State," which he should be peculiarly well qualified to do as a result of his experience as the Government chemist.

The various sections hold their meetings concurrently and independently, except in the instances where two sections meet together to discuss some common subject, as for example, the joint session of the Chemistry Section with the Mathematical and Physical Section on Colloids, when contributions will be made by Professor J. W. McBain, Professor Wilder Bancroft, Professor H. S. Taylor, Professor W. Nash Miller, Professor E. F. Burton, Professor P. J. Maloney, and Professor F. B. Kenrick. Such a list is almost overwhelming; but in addition to theoretical aspects such practical problems as the saponification of oils and fats, the absorption of insulin by charcoal, the presence of colloidal particles or "motes" in distilled water, and the use of indicators in soap solutions bulk largely in the programme. In the Chemistry Section, Professor W. A. Bone, F.R.S., will discuss his work on the activation of nitrogen by the explosion of carbon monoxide-air mixtures at high initial pressures, while a particularly interesting paper will be given by Mr. D. A. Pritchard on the Canadian Salt Co.'s process for the manufacture of alkali and chlorine electrolytically. The last named paper will be followed by one on the electro-refining of nickel by Mr. R. L. Peek, and the two together are expected to give rise to a general discussion on the electro-chemical industries of Canada, to which Professor F. G. Donnan, F.R.S., and other eminent chemists have promised to contribute. The remaining papers in this section are by Professor James Kendall and Mr. Beverley L. Clarke, who are to explain a new method of dealing with that most difficult problem, the separation of the rare earth elements, while Dr. F. W. Atack is presenting a paper on the isomersion of the oximes, and a paper which would appear to be not without interest is to be read by Professor J. F. Snell on the production of malic acid from maple sugar sand.

There are to be three other joint discussions with different sections in addition to the one on colloids. The subject of crystal structure will also be discussed in conjunction with the Mathematics and Physics Section, following the presidential address of that section by Sir William Bragg, F.R.S. Contributions are to be made by Professor W. L. Bragg, F.R.S., Professor C. H. Desch, F.R.S., Dr. G. Shearer and others. The subject of vitamins will be discussed jointly with the Physiology Section, the opening paper being by Professor J. C. Drummond. Finally, the Chemistry Section will join with the Geology Section to discuss liquid and powdered fuels, when Canadian liquid fuels, pulverised coal in metallurgy, and brown coals and lignites form the subjects of the papers. From the above summary it will be seen that those who have the privilege of attending will find a wealth of interest on practical and theoretical matters of topical interest.

Static Electricity Dangers

IN the minds of many of our readers the term "static electricity" will suggest only the somewhat futile experiments which form part of every well-regulated course in electrical science. The most elaborate precautions would be taken by warming up pieces of rabbit-fur till they smelt, or sealing-wax until it was in imminent danger of melting, and then hopefully rubbing the two together, when if one was very lucky it would be possible to repeat certain pretty and historic experiments with a gold-leaf electroscope. The secret of success in these matters lay in having a dry atmosphere, which is, of course, an occurrence somewhat rare in these islands. Text-books on the subject of electrostatics are usually embellished with a cut showing steam escaping from a boiler and point out that the boiler and the steam tend to become oppositely charged. This fact is well known to steam wagon manufacturers, who take precautions against any dangerous electrical accumulation by earthing the vehicle through an apparently useless piece of chain which trails in the road. This static electricity may, of course, be evolved in many similar ways, and when inflammable liquids are about there is a considerable risk of fire if a spark should result. In America, with its drier climate, the chances of this are naturally greater than they are here, and an article recently published in *Chemical and Metallurgical Engineering* deals with the subject and the methods for the avoidance of risk.

Apart from the danger of accumulation of electrostatic charges where there is any escaping steam, the greatest likelihood of sparks being obtained is in cases where non-conducting liquids such as benzol, alcohol, acetone, and so on, are being piped into the tanks. These liquids are just those which are most likely to result in a disastrous explosion. To take the particular case of such a liquid being run into a tank wagon, for example, the piping system, the liquid itself, and the receptacle, are all liable to become highly charged, and the writer of the article referred to above mentions a case in which alcohol was being piped in this way when two slight explosions occurred, although there was a drop of only 8 to 10 inches and the filling line, the tank, and the basket strainer used were all earthed. In this case the difficulty was overcome by lowering the lead-in nozzle below the level of the liquid in the tank. This, of course, is not always possible, but it is desirable that the nozzle should be in direct contact with the tank at all times. Discharges of static electricity are liable to take the shortest route, and it is not only necessary for plant to be earthed at one point; if there is any risk of accumulation of electricity at a remote part there is a chance that it may cause a spark although provided with a somewhat indirect path to earth through conducting material.

In this connection the action of points and sharp angles in harmlessly dissipating electric charges must not be forgotten, however. The above precautions, though not perhaps of so great importance in this country as in the United States owing to our normally damper atmosphere, should certainly not be neglected by those responsible for the handling of inflammable liquids, as properly carried out they may be the means of avoiding explosion and fire with their attendant loss.

British and German Chemistry

WHAT is the real position of technical chemistry in Germany at the present day? There are several indications that the prospect is by no means so rosy-hued as certain authorities would have us believe. Under the title, "Modern Technical Methods for the Manufacture of Synthetic Perfumes," a contemporary has published a number of practical recipes from the pen of an expert German manufacturer. Nor are these merely paper recipes; they are detailed works processes, evidently evolved from actual works experience. Why are they communicated to us? Why are our manufacturers receiving from Germany so many offers for the sale of works recipes under conditions which practically ensure their genuineness? What makes even the "I.G." so anxious to come to an arrangement with the British Dyestuffs Corporation? The conditions in Germany are surely not so desperate that every shilling counts, and German knowledge, acquired at considerable expense during forty years, must be converted at whatever sacrifice into English sterling or American dollars. The only alternative explanation is more flattering to British technical chemistry than we have hitherto been allowed to believe. For the last six or seven years we have been compelled to work out methods for the manufacture of dyestuffs and other organic chemicals previously supplied by Germany. In many directions we have succeeded far better than was ever anticipated, but Germany does not greatly fear our competition in articles she has made for years. We have now, however, been able to enter upon a new phase. The "bread and butter" chemicals are more or less established—sufficiently so, at any rate, to prevent us from starving if Germany held up supplies—and the genius of British chemistry is beginning to show itself in the more genial sphere of invention and discovery. This phase is only just beginning and its results are scarcely apparent, but it seems that Germany has seen and is afraid.

Advertising Chemistry

A GOOD deal has recently been heard of the art of advertising, and we notice that in some quarters claims have been made for its inclusion among the sciences. The Advertising Convention has just discussed the business and technical aspects of advertisement pretty thoroughly, and the conclusion universally arrived at was to the effect that publicity based on veracity and a true appreciation of public taste is a thoroughly sound, artistic and indispensable factor of business activities. Ordinary business advertisement we may safely leave for the moment to those whom it more closely concerns, but what of publicity as related to the achievements of chemical science? Personal advertising by chemists has long been frowned upon in this country, and, indeed, it is a breach of the regulations of the Institute of Chemistry just as it is of the Medical Association. This attitude is mainly a matter of professional etiquette and decorum and has always been upheld by the body of our professional chemists. There is a type of publicity, however, which in no way offends these rules. Even the most esteemed of our daily newspapers very rarely attempt to tell the country of what our chemists are doing; indeed, the ordinary newspaper reader still continues to indentify a chemist with a drug stores, prescriptions, and certain essential household commodities.

It is true that if anything very startling occurs, our daily press is usually well to the fore with it, as witness the mild sensation a week or so ago following the news from Germany that mercury had been transmuted into gold. Apart, however, from an occasional reference of this kind, one rarely finds anything of real chemical interest, so that the general reader is seldom, if ever, given the latest news from the chemical front, and it is only quite recently that there has been a somewhat half-hearted recognition of our distinguished chemists in the press. Articles on engineering of a serious and informative nature frequently appear in the columns of some or our newspapers, but an account of the work of the great chemists and their services to the community as a feature of our daily press is yet to be—and this in spite of the fact that the largest and most artistic and picturesque branch of the advertising profession would be nowhere without the chemist and his wonderful command of processes.

Points from Our News Pages

An article by Mr. P. Parrish on the Electrolytic and Solvay Processes for Soda Manufacture deals in detail with the problem of utilising the by-products in each case (p. 114).

A further letter is published on "The Analysis of Brass and Gun Metal" (p. 117).

A summary of the events in the "Yadil" dispute is given (p. 117).

Our Metallurgical Section contains an exhaustive review of a recent work on "Modern Open Hearth Steel Works" and an article on "Bricks from Blast Furnace Slag," in addition to the usual monthly notes on general, financial and commercial topics.

According to our London Market Report the position is fairly satisfactory, though export trade is quiet (p. 125).

The Scottish Chemical Market has shown an upward tendency and a considerable number of inquiries have been received (p. 128).

The Calendar

Aug. 6–13	British Association for the Advancement of Science Meeting	Toronto
Sept 4–5	Iron and Steel Institute Autumn Meeting	British Empire Exhibition, Wembley
8–11	Institute of Metals	London

Electrolytic Caustic Soda and Solvay Processes.—II.

By P. Parrish, A.I.C., M.I.Chem.E.

In our issue of June 28 Mr. Parrish dealt with the possible menace to the Solvay ammonia-soda process by the development of the electrolytic production of caustic soda, and in the following article he deals in greater detail with the question of the utilisation of the by-products, upon which the economic success of both processes depends.

In the first article it was shown that the development of the electrolytic caustic soda process was largely dependent on the utilisation of the secondary products—chlorine and hydrogen. Until further markets are created for chemicals involving the use of these gases it is feared that the manufacture of electrolytic caustic soda will be somewhat restricted.

It is not improbable that the major requirements of the world in the matter of soda ash will continue to be met by the product of the Solvay process. On the other hand, given markets for chlorine-containing products, there is reason to believe that the bulk of the world's requirements of caustic soda will result from the electrolysis of a saturated brine.

The economic disposal of chlorine and hydrogen plays, and will continue to play, an important part in the success and growth of the electrolytic process.

It will be interesting to examine at this juncture the economic aspect of the latter process, and to determine how far the disposal of chlorine and hydrogen affects the position.

Premises

For the purposes of calculation the following figures will be assumed :—

	£	s.	d.
Power, per kilowatt hour	0	0	0·35
Coal	1	7	6
Salt	1	0	0
Labour, per 8-hour day	0	12	0

Technical Data

The following technical data will need to be considered in the preparation of the cost sheets. They have reference to the Allen-Moore type of cell, and apply to a single cell under practical working conditions.

I. Production of Chlorine Gas and Caustic Soda for 24 Hours.

1,500 amperes chlorine	96·1 lb.
caustic soda	108·5 lb.

The above is based on a 92 per cent. efficiency in the following manner :—

$$1{\cdot}32 \text{ gms. (electrochemical equivalent)} \times \frac{1{,}500}{1{,}000} \times 2{\cdot}20 \times 24 \text{ hours} \times 0{\cdot}92 = 96{\cdot}1 \text{ lb. chlorine.}$$

$$1{\cdot}49 \text{ gms. (electrochemical equivalent)} \times \frac{1{,}500}{1{,}000} \times 2{\cdot}20 \times 24 \text{ hours} \times 0{\cdot}92 = 108{\cdot}5 \text{ lb. caustic soda.}$$

II. Voltage and Power Requirements.

(*a*) Voltage at 1,500 amperes, 4·2 maximum average.

(*b*) Power requirements at 1,500 amperes = 1,500 × 4·2 = 6,500 watts, or 6·3 kilowatts.

The factors affecting voltage efficiency will be discussed in a subsequent article.

III. Current Efficiency—92 per Cent.

This has reference to actual yield per ampere hour expressed as a percentage in relation to the theoretical yield per ampere hour. It will be seen that a 92 per cent. efficiency is given. In actual practice plant records show, with Allen-Moore cells, that the average current efficiency is from 2 to 5 per cent. beyond that named above, with, of course, a corresponding higher energy efficiency.

IV. Energy Efficiency, or Combined Current and Voltage Efficiency.

1,500 amperes, 50·38 per cent.

This figure is arrived at as follows :—

$$\frac{2{\cdot}3 \text{ (theoretical voltage)} \times 0{\cdot}92 \text{ (current efficiency)} \times 100}{4{\cdot}2} = 50{\cdot}38 \text{ per cent.}$$

V. Decomposition Efficiency.

The ratio of salt decomposed to the salt supplied to the cell, based on an average brine containing 315 gms. of sodium chloride per litre.

$$\frac{(315-140)}{315} = 55{\cdot}55 \text{ per cent.}$$

VI. Cell Consumption

1,500 amperes, 212 lb. in 24 hours.

The above figure is based on results obtained from commercial practice and fairly represents the salt consumed by one cell in 24 hours. Being a practical figure it includes, in addition to the mechanical loss of salt in the process, the loss of salt which occurs from the evaporation of the effluent and the salt retained in the heavy caustic liquor.

VII. Analysis of Caustic Effluent.

	Gms. per litre.	Per cent.
Sodium chloride	140	11·6
Caustic soda	120	9·89
Iron	Trace.	—

This analysis of the cell effluent represents what may be fairly expected of the cells in actual practice. With a cell effluent containing approximately 11 per cent. of sodium chloride and 9 per cent sodium hydroxide, the current efficiency will be 92 per cent. or over. If 0·5 per cent. of sulphate is present in the salt, it should be removed before electrolysing the brine; barium chloride can be used for this purpose. Failure to remove the sulphate will lead to contamination of the electrolyte and result in deterioration of the graphite anodes.

VIII. Anode Current Density at 1,500 Amperes.

The active anode surface is 2,880 square inches.

$$\frac{2{,}880}{1{,}500} = 1{\cdot}92, \text{ or one ampere of } 1{\cdot}92 \text{ square inches.}$$

Cost Sheets

Based on the production of 1 ton of caustic soda per day :—

		£	s.	d.
(1)	Power—			
	(*a*) For electrolysis, at 1,500 amperes. Say, 21 cells × 6·3 kilowatt hours × 24 hours ..... 3,175 k.w.h.			
	(*b*) For auxiliaries (say) .... 25 ,,			
	3,200 ,,			
	Cost, 3,200 k.w.h. × 0·35d. per k.w.h.....	4	13	4
(2)	Evaporation : 18 cwt. of coal at 1s. 4½d. per cwt.	1	4	9
(3)	Labour : 1 chemist-superintendent, 1 foreman, 1 engineman, 3 salt and brine men, 1 evaparator man, 2 labourers	*5	11	2
(4)	Salt : 1·70 tons at £1 per ton.....	1	14	0
(5)	Purification of salt, assuming a good grey salt or reasonably pure brine : 1·70 tons at 2s.	0	3	5
(6)	Maintenance of cells, graphite, asbestos and incidentals	0	12	6
(7)	Maintenance of caustic pots and settings (say)..	0	2	6
(8)	Interest on capital at 5 per cent, and depreciation of plant 10 per cent. on cost of installation, £5,000 ; 15 per cent. on £5,000 for one day (300 working days per year).....	2	10	0
		£16	11	8

Production

1 ton caustic soda (76 per cent. Na_2O).
17¾ cwt. chlorine.
56 lb. hydrogen.

*With a 300-cell plant this labour cost would be reduced by more than 50 per cent.

It will be assumed that a market exists for hydrochloric acid. The chlorine and hydrogen will therefore be used for the synthetic production of this acid. Plant to deal with 17¾ cwt. of chlorine per day and its equivalent of hydrogen will cost approximately £1,000.

The Cost of Manufacture of Synthetic Hydrochloric Acid

Capacity: Based on 90 per cent. efficiency=16·2 cwt. of hydrochloric acid (100 per cent.).

	£	s.	d.
17¾ cwt. chlorine		—	
½ cwt. hydrogen		—	
Labour: three men per day at 12s.	1	16	0
Repairs and maintenance expenses	0	4	0
Interest on capital, 5 per cent., and depreciation of plant, 10 per cent.; 15 per cent. on £1,000 for one day (300 working days per year)	0	10	0
	£2	10	0

PRODUCTION

16·2 cwt. of 100 per cent. hydrochloric acid=54 cwt. of 30 per cent. hydrochloric acid.

REVENUE.

To-day's selling price for 30 per cent. hydrochloric acid, excluding cost of carboys, is £3 15s. per ton.

	£	s.	d.
54 cwt. at 3s. 9d. per cwt.	10	2	6
Net profit £10 2 6			
2 10 0			
	7	12	6

Thus the cost price per ton of caustic soda is reduced by £7 12s. 6d. It is conceivable that by producing liquid chlorine or bleaching powder even greater profits can be made. The foregoing cost figures serve better than any amount of written matter to demonstrate the part which the utilisation of the subsidiary products—chlorine and hydrogen—plays in the economics of the electrolytic caustic soda process.

It is now proposed to discuss the considerations surrounding the adoption of an electrolytic caustic soda scheme, and the layout of the plant. It will be appreciated from the cost sheet figures that the geographical position of the works is an important factor. Equally, the size of the unit is a consideration demanding careful thought. In certain geographical situations a 50-cell installation will prove an economic unit; in others, a 250-cell plant may be necessary. Those responsible for the promotion of schemes involving the erection of electrolytic plant will realise how important it is to take into careful account the size of the installation, having regard to local and geographical considerations.

Need for Disposal of By-Products

An examination of the cost sheet will show that contrary to what is essential with the Solvay ammonia-soda process, an electrolytic caustic soda plant need not necessarily be located in a brine-bearing or salt-containing district. What is more important is that the site of the works should be in a district where the primary article and by-products can be disposed of advantageously, where suitable labour can be obtained and where cheap power and fuel are available.

Reference to the cost sheet shows that basing on electric power at 0·35 d. per kilowatt hour, this item represents 28½ per cent. of the total cost of production. Again, fuel for the evaporation of the weak caustic soda to the solid state accounts for 7·5 per cent. of the total cost, when basing on fuel at 27s. 6d. per ton.

In this country water power is not available in industrial areas where there is likely to be a demand for both caustic soda and chlorine-containing products. It is hardly likely, therefore, that the fabulously low power costs of 0·05d. per kilowatt hour, of which one hears so much as applying to certain Continental electro-chemical works, will be realised.

Some guidance as to the type of power plant to adopt is to be found by consideration of the experience of electrolytic works in this country. Originally, in connection with one tolerably large sized works, the electrical energy was derived from high-speed engines of the Willans and Robinson type, but as the works developed, steam was displaced by a Mond gas plant. Later, the latter installation was superseded by an up-to-date steam turbine generating plant, embracing boilers of the Babcock and Wilcox marine type. In addition to this, one need only refer to the experience of the various electric lighting and power companies and corporations throughout the country to be apprised of the best type of power unit to adopt. Much published matter is available on this aspect, irrespective of the figures as to the actual costs of generation at the various electricity works of the country.

It would appear premature at this juncture to review the whole of the considerations involved in the selection of the type of cell to be adopted. This important feature will be summarised in a later article, after the characteristics of various types of cells have been fully discussed. *En passant*, it may be said that high current and energy efficiencies are not necessarily the essential points for consideration in the choice of an electrolytic cell. Initial capital cost, the expenses involved in the renewal of diaphragms, the strength of the caustic liquor produced in the cathode department, which has an important bearing on costs of evaporation where it is proposed to manufacture solid caustic soda, and anode consumption, are all vitally important points to which attention should be given in determining the type of cell to be installed.

Finally, the method of the disposal of the by-products—chlorine and hydrogen—demands careful thought. In preparing an inventory of the various modes of utilisation, it is found that a fairly extensive list can be compiled, but unfortunately, the demand for the various products appears to be limited.

Methods of Utilisation of the By-Products

The methods by which the by-products can be utilised are indicated below:—

(1) Fixation of chlorine by slaked lime as bleaching powder.

(2) Liquefaction of chlorine by compression.

(3) Fixation of chlorine in the form of inorganic products, (*a*) as synthetic hydrochloric acid, (*b*) as a de-tinning agent whereby $SnCl_4$ is produced, and (*c*) different metallurgical applications.

(4) Fixation of chlorine as organic derivatives; thus (*a*) chlorinated products used in the manufacture of dyes such as monochloracetic acid, etc., (*b*) as solvents—carbon tetrachloride, etc., and (*c*) chlorine derivatives of acetylene, etc.

The foregoing methods of utilisation can be amplified with advantage.

Manufacture of Bleaching Powders

The world's production of this article is about 300,000 tons, having a content of available chlorine of about 35 per cent. In other words, the production of bleaching power absorbs approximately 100,000 tons of chlorine per annum. The manufacture of bleaching powder is simple when viewed from a theoretical point of view. Slaked, sieved lime, preferably of the Buxton quality, is fed to the hopper of a Hasenclever mechanical absorber. This consists of several superposed lead cylinders, each provided with worms for ensuring the movement of the slaked, sieved lime. This material travels in a counter-current manner to the gaseous chlorine. Hasenclever mechanical absorbers have not been found too efficient where strong gases are used, as is the case with electrolytic processes. Too much heat is generated, and loss of chlorine results, by reason of the formation of chlorate. The Rudge revolver type of absorber is known to be more satisfactory than the Hasenclever for chlorine arising from the electrolysis of a saturated brine. The Griesheim Electron Co. prefer to manufacture calcium hypochlorite by the passage of chlorine into milk of lime, and the subsequent evaporation under vacuum. In this way a more stable product is secured than bleaching powder, giving a clear solution and containing 80 to 90 per cent. of available chlorine.

It should be remarked that there are certain disadvantages attending the use of electrolytic chlorine in the production of bleaching powder, due to an abnormal amount of this gas combining as calcium chloride as soon as the chlorine comes in contact with the lime. The chlorine being in a nascent state is extremely active, and without doubt this condition

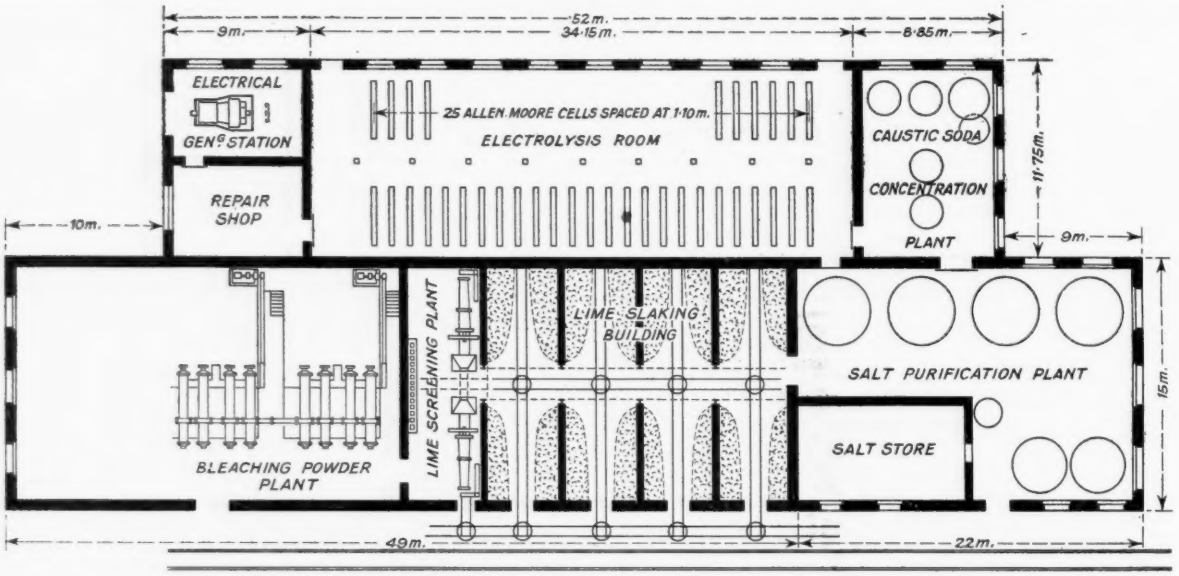

FIG. 1.—PLAN OF AN ELECTROLYTIC CAUSTIC SODA INSTALLATION (50 ALLEN-MOORE CELLS)

accounts for the phenomenon referred to. It is known that chlorine can be so treated as to be free from any disability of the character indicated.

Liquid Chlorine

Liquid chlorine is now a commercial product, and has found fairly wide application. It is utilised extensively in the extraction of gold, bromine and iodine; in the manufacture of aniline dye intermediates, for the preparation of chloracetic acid, used in the synthesis of indigo and isoprene, for the synthesis of rubber. Widely used in the chlorination of organic compounds, it is equally extensively employed for the sterilisation of water supplies.

In Japan the surplus chlorine from electrolytic processes has found an important outlet in the manufacture of chlorates and perchlorates.

Having traversed some of the more important considerations affecting an electrolytic caustic soda scheme, and having considered methods of utilisation of the by-products, it is desirable now to devote attention to the lay-out of the plant.

Lay-out of Electrolytic Caustic Soda Plant

Fig. 1 represents a plan of an installation of fifty Allen-Moore cells. It will be seen that this arrangement embraces plant for the purification of salt, the generation of electrical power and the concentration of the weak caustic soda solution to solid caustic. Moreover, provision is made for the utilisation of chlorine as bleaching powder, suitable plant for the production of which is incorporated in the scheme.

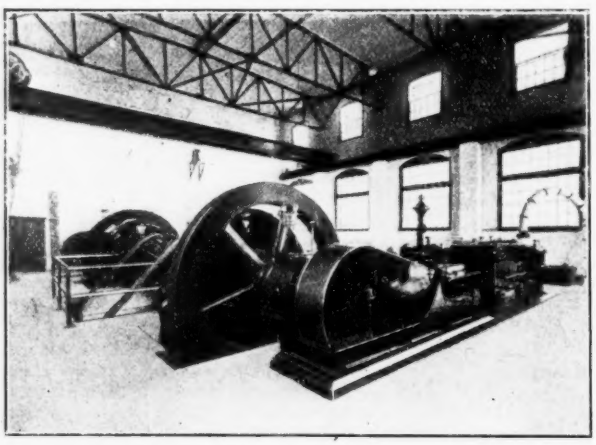

FIG. 2.—ENGINE ROOM AND ELECTRICAL INSTALLATION PLANT

In one works arranged in an almost identical manner to that indicated, it is known that provision has been made for the production of synthetic ammonia from the hydrogen generated. Here is a development which will be followed with interest, as hitherto it has been represented that the minimum economic unit for synthetic ammonia production was two tons per day.

Bearing upon the lay-out the following points are of interest:—

The preparation of the electrolyte, which should be a saturated solution of salt, has to be provided for. The purification consists essentially in the removal of all calcium and magnesium compounds and sulphates. The solution is usually made by passing water under positive pressure upwards through a mass of salt contained in a saturating tower, the rate of flow being so governed as to ensure a saturated solution issuing at the top. From the saturator, the raw brine is pumped to purifying tanks. After precipitation of the impurities referred to, they are removed either by decantation or filtration. Subsequently, provision must be made for the storage of the purified brine, and its gravity feed at a constant rate through iron pipes to the electrolysers.

The disposition of the cells in the cell-room must be such as to allow of unhampered access to any part.

Fig. 2 gives an idea of the disposition of the engine room and the electrical generating plant.

The question of the type of plant to be adopted for the evaporation of the caustic effluent is an important one. There are many excellent types of evaporators on the market, but it has to be remembered that the evaporation of an electrolytic caustic soda effluent is a different proposition to that of a caustic soda solution arising from the causticification of soda ash. As has been pointed out earlier in this article, a solution of electrolytic caustic soda contains from 10 to 15 per cent. of salt (NaCl), and hence circulation in the evaporator must be of a vigorous order. Fig. 3 shows a double effect evaporator as made by E. Scott and Co., Ltd., of Silvertown, London. It has been used for evaporation of electrolytic caustic soda solutions with marked advantage and efficiency. It will be noted that the second effect of this plant is fitted with a salt box. In the first effect no salting occurs. One feature of this plant is that reliance is not placed on one central down-take placed at the side of the evaporator, but upon intensified local circulation. Five and a half inches diameter circulating tubes, nested among 2 in. evaporating tubes, are used. Thus rapid circulation is ensured.

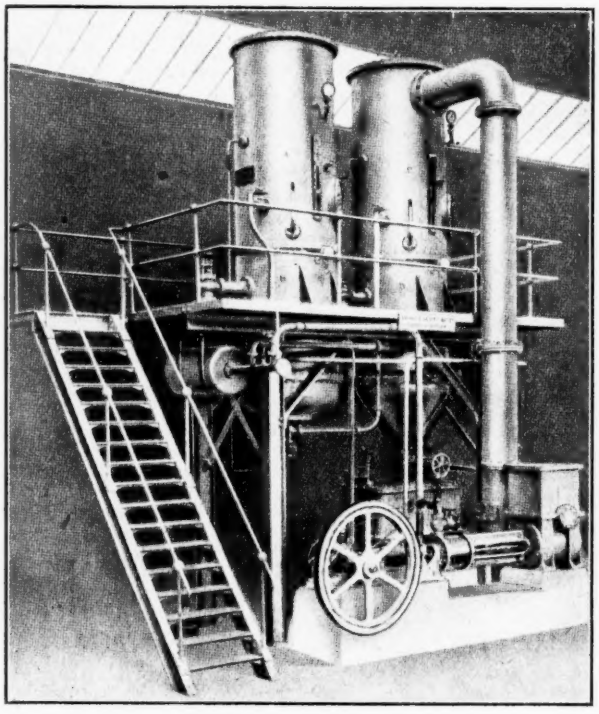

FIG. 3.—E. SCOTT & CO., LTD., EVAPORATOR (DOUBLE EFFECT) WITH SALT BOX.

The concentrated caustic solution in the last effect is discharged into the salt box, where it is cooled, thereby precipitating salt slime held in suspension in the hot liquor. The cooled caustic is decanted and pumped to storage tanks as a 96° Tw. solution (46 per cent. NaOH), containing a maximum of 1 to 1½ per cent. of salt. The question of evaporation is a large one, and will need to be enlarged upon subsequently, but it is desirable to remark here that it is vitally important to keep the salt caustic effluent free from hypochlorites, as otherwise destruction of the evaporator tubes and steam jets will ensue.

Fig. 4 shows the caustic pots for the production of solid caustic soda. Many factors of importance arise in this connection, but the discussion of these and many other matters of interest must be reserved for treatment in a subsequent contribution.

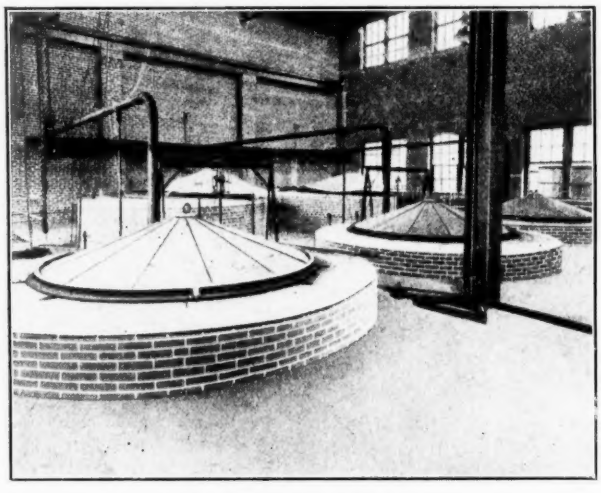

FIG. 4.—CAUSTIC SODA POTS.

Analysis of Brass and Gun Metal

To the Editor of THE CHEMICAL AGE.

SIR,—The letter from "C.C.D." only adds to the gloom. Would he mind stating the degree of accuracy or inaccuracy of which the method is capable when Cu,Sn,Pb,Fe,Al,Zn, are estimated in one hour ten minutes ?—Yours, etc.,

Birmingham. REGINALD G. JOHNSTON.

The "Yadil" Dispute

FOLLOWING the articles by Sir William Pope and Professor W. E. Dixon in the *Daily Mail*, the proprietors of "Yadil" published in several newspapers on Monday an advertisement headed "The Truth about 'Yadil' Antiseptic." This announcement was described in its opening paragraph as a full explanation of the history, composition and proved value of "Yadil" Antiseptic. It was further stated that it was not, and never had been, a secret remedy. Authorities were also quoted to show that paraformaldehyde was non-poisonous and had been used with success in the treatment of a variety of ailments, including tuberculosis.

A writ for alleged libel was also served on the proprietors of the *Daily Mail*, Sir William Pope and Professor W. E. Dixon. On Tuesday morning application was made on behalf of Clement and Johnson, Ltd., manufacturers of "Yadil," and another, before Mr. Justice Roche, sitting as a judge in Chambers, for an interim injunction restraining the defendants (Associated Newspapers, Ltd.), pending trial of the action, from repeating the statements or from making similar statements. The judge refused the injunction on the ground that the defendants had filed affidavits stating their intention to justify the statements complained of.

Later in the day Mr. Robert Fortune, counsel for the plaintiffs, applied to the Court of Appeal for the expediting of the hearing of an appeal by his clients against this refusal. He stated the grounds on which Mr. Justice Roche had refused the interim injunction, and added that his lordship had granted leave to appeal against his decision. The campaign against "Yadil" had been going on in the *Daily Mail* for a week, and the plaintiffs, desiring to be protected against a continuance of the attack during the Long Vacation, asked to have the hearing of the appeal expedited.

Lord Justice Bankes said once the defendants had intimated an intention to justify, there was end of the matter so far as the interim injunction was concerned.

Mr. Fortune said the defendants were accusing the plaintiffs of what amounted to a criminal offence—a very serious matter to the plaintiffs, who desired to have the opinion of the Court of Appeal as soon as possible.

Lord Justice Bankes said, on the face of the defendants' affidavit, the matter could not be expedited, and the appeal must take the ordinary course.

Patent Extension Petition

MR. JUSTICE TOMLIN, in the Chancery Division, on Monday, had before him the adjourned petition of the Oil Refining Improvements Co., Ltd., of West George Street, Glasgow, for an extension of the term of a patent relating to improvements in the treatment of mineral and vegetable oils.

The petition was opposed by the Board of Trade, who alleged prior knowledge and lack of merit. The patent was for a new process for the decolorisation and desulphurising of oils, and it was stated that it had been the subject of exhaustive experiments by Dr. Alfred Ernest Dunstan, chief chemist of the Anglo-Persian Oil Co., who were prepared to take up a licence to work the invention if the experiments proved to be successful. The petitioning company had, it was said, lost £13,000 since 1909 in exploiting the patent, but that it was likely to prove of great commercial importance for the purification of oils in a year or two.

Mr. Courtney Terrell, for the Board of Trade, argued that the degree of merit necessary in an invention of this kind was absent in this case, and that the invention had been anticipated.

Mr. Moritz, for the petitioners, said the strongest evidence of the merit of the invention was the fact that the Anglo-Persian Oil Co. had adopted it. Before this process the only method of filtration was by the use of crude sulphuric acid.

His lordship gave judgment on Thursday against the petitioners.

Silicate of Soda and Concrete

[From a Correspondent.]

The great possibilities of the silicate of soda process for the hardening of concrete after setting are at last being realised, and the success of this simple and inexpensive method of treatment is due to the research work that has been concentrated on the subject within the last few years. As a result it is now known that for the best results with silicate of soda and concrete it is important to use a product of the correct grade or "ratio" with a fairly high proportion of silica to soda. Further, also, the commercial silicate of soda solution must be sufficiently diluted, say one part with four parts of water, so that it may penetrate freely the surface of the concrete, which also has to be clean and as dry as possible, to a depth of, say, ¼ to ½ inch. The result is the formation of an intensely hard and dense outer layer, due to the precipitation within the pores of colloidal calcium silicates, and also of free silica. The formation of calcium silicates is due to the fact that free calcium hydrate has been separated in the setting of the cement by the water used in mixing decomposing polycalcium silicates, and this reacts with the sodium silicate solution.

It is interesting to note that Brunner, Mond and Co., Ltd., who have carried out for a number of years past very extensive research work in the manufacture and application of silicate of soda, have now found it necessary to issue a new and enlarged edition of their interesting pamphlet, "Silicate of Soda and Concrete," which may be had on application to their head office, Northwich, Cheshire.

There is no question that one of the most valuable applications of the process is in connection with the hardening of concrete roads to resist abrasion and wear and tear due to heavy motor traffic, and great developments in this direction are pending. Special attention is given, therefore, in the new edition to this question of concrete roads, the exact method of application being described in detail, whilst the favourable experiences with the process of a number of prominent engineers in Great Britain are quoted, the Borough of Southwark (London) and the case of Motherwell and Wisham being particularly good examples.

Thus Mr. A. L. Thomson, M.R.S.I., M.Inst.M. and Cy.E., the joint surveyor of the latter two burghs, gives it as his opinion, based on considerable practical experience, that the silicate of soda process for concrete roads results at a most reasonable cost in an increase in life because of the resistance to abrasion and disintegration, and also a reduction in dust formation, whilst the surface is not rendered slippery or unsuitable for tar treatment. There is also discussed in the new publication the application of silicate of soda to concrete in the case of factory and garage floors, oil tanks, water tanks, and sea walls, whilst it is interesting to note in the case of concrete sewage tanks that the silicate of soda treatment is found to result not only in reduced permeation by water, but also in the elimination of the growth of fungus on the walls. The actual hardening effect on concrete is being demonstrated on Brunner, Mond and Co.'s stand at the Chemical Section, Wembley, by means of a motor-driven abrasion machine. In this blocks of sand cement, one half of which has been treated with silicate of soda solution, are subjected to the rubbing action of two heavy pieces of steel, when the untreated portion is seen to be worn away whilst the other is little affected.

Imports of Chemicals into Hongkong

Great Britain has a good share in the market for chemicals at Hongkong, but for the most part business during 1923 was dull and uninteresting, due to the general trade depression and unsettlement in China. Sulphate of ammonia is the principal item, imports for the first six months of the year amounting to approximately £250,000, which represents an increase over previous years. As Germany is unable to export most of the supplies are now received from Great Britain and the United States. The American Consul at Hongkong reports that stocks on hand were plentiful, amounting to over 4,000 tons, with little prospect of any large sales this season on account of floods and fighting in the interior. Imports of caustic soda for the first six months of 1923 were nearly 50 per cent. below those of 1922, England supplying most of this chemical, while imports of soda ash represented a decrease of about 100 per cent.

Nauru Island Phosphates

A difficult position is reported to have arisen in Australia in connection with the phosphate deposits in Nauru and Ocean Islands. One subject of controversy is the question of sales of phosphate to foreign countries. The agreement provides that no phosphate shall be sold outside the three participating Governments except by unanimous consent of the three commissioners. Last year the output was distributed to Australia (320,000 tons), New Zealand (60,000 tons), and foreign countries, principally Japan (71,000 tons). The United Kingdom did not exercise its right to a proportion of the output, British manufacturers finding the supplies of North Africa and Florida more convenient. The British Government apparently desires to continue foreign sales, while the Australian commissioner proposes to eliminate them this year. Another difference has arisen regarding the proposed improved loading facilities at Nauru, which would considerably increase the output of phosphates and reduce the cost of labour, freight, and handling charges. It is understood that, exercising its right under the agreement, the British Government has withheld consent to expenditure in this direction. It is suggested that the only effect of this action is to benefit the Anglo-French Company which purchased the Pacific Phosphate Company's interests in Makatea, a French island in the Tahiti group, as against the combined interests of the British, Australian, and New Zealand Governments in the Nauru Ocean Islands.

Naphthalene as a Solvent of Coal

In work carried out recently in France by M. Oswald, attention has been directed to naphthalene as a solvent of coal, which is used at the boiling point, in an apparatus with a reflux for consuming the coal. The work is done in an inert atmosphere—carbon dioxide or nitrogen. In a coal containing 35 per cent. of volatile material it has been found that 13 per cent. is soluble in the naphthalene. The extraction should be made in the absence of oxygen, which by oxidation gives insoluble compounds, compounds such as are found, moreover, in the original coal, since the coal on the surface gives less matter soluble in the naphthalene than the coal taken from the centre of the block.

The extraction operations present the inconvenience of requiring a large quantity of naphthalene, but the extract obtained constitutes a first class fuel since the higher calorific power contributed to the dried coal, free from ashes, is greater for the naphthalene extract than for the original coal. Furthermore, this fuel gives a very pure coke, since it contains no ashes, and its utilisation is considered for the production of calcium carbide or other very pure mineral carbides, as well as for the reduction of the ore.

Use of the Title "International Laboratories"

Mr. Justice Tomlin, in the Chancery Division on Friday, July 25, had before him a motion by Ralph Sweet, trading as The International Laboratories, for an injunction restraining The International Laboratories Co., Ltd., of Arlsheim, Switzerland, from carrying on business in Great Britain under that name, or any other name so closely representing the plaintiff's trade name as to cause confusion in the mind of the public.

Mr. McKay (for the plaintiff) said the defendants had consented to submit to an injunction as claimed, and to treat the motion as the trial of the action.

His Lordship made an order accordingly.

Gretna Sales

The glycerin distillery at Gretna, which covers 20 acres and has a possible output of nearly 50 tons daily, was to have been sold by auction on July 24. Only two bids, of £5,000 and £5,500, were received, and as the plant itself is worth considerably more than these figures, the property was withdrawn. On July 26 the ether distillery was put up for auction but was withdrawn at £18,500. It afterwards realised £20,000 by private sale to Thomson and Sons, contractors, Carlisle. There is still available at Gretna refrigerating plant, including ammonia compressors, condensers and water coolers.

Australian Tannin Research

AT the Commonwealth Institute of Science and Industry laboratories recently a considerable examination of a large variety of barks and woods has been carried out to discover their tannin content; in most cases these barks and woods are waste products following forestry operations. The Director of the Institute (Sir George Knibbs) now proposes to prepare tannin extracts on a semi-commercial scale of operations from a selection of the more common and readily available barks and woods which examination has shown warrant testing. The object of such semi-commercial work is to obtain information respecting the preparation of mixed or blended tannin extracts, and to determine the yield and quality of the extract. The data thus available would be of the greatest value in connection with the establishment of a tannin extract industry in Australia. It is proposed that the Institute should obtain a complete and most modern up-to-date experimental plant for preparing the tannin extracts on a scale of operations capable of turning out a few cwts. of the finished product per day.

Information Bureaux and Special Libraries

A CONFERENCE will be held at High Leigh, Hoddesdon, Herts, during the week-end September 5–8, to which are invited all men and women who need to utilise information systematically, or who are interested in the conduct or operation of information bureaux, intelligence services and special libraries. The programme will include papers and discussions on the functions, future developments, and the methods and equipment of intelligence bureaux, and on their relations with other institutions, including national and public libraries. It is hoped to obtain representatives of such varied fields of activity as Government and municipal departments, technical and research institutions, industrial concerns, financial houses, insurance offices, newspapers, and civic and social organisations, all of which have a common interest in the collection, treatment and dissemination of facts and information relevant to their particular activities. Further information may be obtained from Mr. A. F. Ridley, Athenæum Chambers, 17, Temple Row, Birmingham.

Automatic Weighers and Air Pumps

MODERN British power-house practice is well-exemplified at Wembley in the Palace of Engineering, and among the various devices which are employed in the interests of efficiency automatic coal weighers will be noticed. Among the various types of weigher now on the market a simple pattern made by H. J. H. King and Co., Ltd., of Nailsworth, Gloucestershire, is worth consideration. This is available in sizes from 10 to 50 tons per hour, and is described in an illustrated leaflet which has been received from the firm. The firm also make a type of combination feeder and weigher which is more suitable for the highly developed plant. A great feature which adds to the utility of these weighers is that they are specially designed for handling damp material. It may be noticed that the firm also make a speciality of Edwards' type air pumps of various sizes, either motor or belt-driven, which are guaranteed to pull a vacuum up to 29½ inches.

Institute of Metals: Autumn Meeting

THE autumn meeting of the Institute of Metals will be held in London from September 8 to 11. It is hoped that as the meeting will be held during the period of the British Empire Exhibition it will attract a large number of members, including many from overseas. In order that the arrangements may be completed satisfactorily, members wishing to attend and who have not already done so should obtain an application form from the Secretary, 36, Victoria Street, S.W.1, and return it not later than August 23. The programme includes many visits to works and places of interest, and the subject of the annual Autumn Lecture to be delivered by Mr. W. M. Corse, of the National Research Council, Washington, D.C., U.S.A., is "Recent Developments in Non-Ferrous Metallurgy in the United States, with Special Reference to Nickel and Aluminium-Bronze."

Chemical Matters in Parliament

Anglo-Burma Oil Company

Mr. A. M. Samuel (House of Commons, July 22), asked the President of the Board of Trade whether his attention had been drawn to the official receiver's report of the Anglo-Burma Oil Company, which discloses the fact that a large capital sum had been lost, that there was a deficiency as regards creditors, and that the cash assets amounted to 2s. 8d.; and whether he would appoint a Departmental Committee to examine the Companies Acts for the purpose of ascertaining in what particulars they can be amended so as to render it less easy for the principles of limited liability to be used in future in such a way as to permit of results such as those mentioned.

The President of the Board of Trade (Mr. Webb), said he understood the position disclosed in regard to the affairs of this company was as stated, and the last part of the question raised by the hon. Member should have consideration.

Mr. Samuel asked if this recent case was not a further and immediate proof that steps should be taken to set up a Departmental Committee in order to amend the Companies Acts in such a way as to protect the public against scandals of the kind referred to.

Torpedoes and Cordite

Lieut.-Commander Kenworthy (House of Commons, July 23) asked the Parliamentary Secretary to the Admiralty what proportions of the torpedoes and cordite for the Royal Navy were manufactured at the Royal Naval Torpedo Factory and the Royal Naval Cordite Factory, respectively; whether these factories were capable of supplying all the needs of the Fleet; and whether, as a step towards the abolition of the private manufacture and traffic in arms, he would consider manufacturing all torpedoes and cordite in the Royal factories or, alternatively, of enlarging them so that this could be done.

Mr. Ammon said that the whole of the present needs of the Fleet for torpedoes and cordite were met by manufacture at Government factories.

Gretna Sale

Mr. T. Johnston (House of Commons, July 24) asked the Financial Secretary to the Treasury whether he was aware that an offer was made for the ether plant at Gretna by the Alcohol Fuel Corporation, Ltd., which corporation proposed ultimately to give employment to thousands of people in the manufacture of a motor fuel; if he could say why the offer was refused; and, if refused on financial grounds, would he say whether the Government itself intended to use this plant in the production of motor fuel.

Mr. Graham said the answer to the first part of the question was in the affirmative. An offer was received from the Alcohol Fuel Corporation in May, 1923, and was, after full consideration, declined in June, 1923, on financial grounds. As regards the last part of the question, the plant was being offered for sale by auction as a going concern.

Mr. Johnston asked, whether, in view of the absolutely ridiculous prices at which this public plant was being disposed of, could it be undertaken that this very valuable plant would not be disposed of at rubbish prices so long as firms were able and willing to offer commercial prices for it.

Mr. Graham, in reply to this and other questions, said that the Government had decided to put up this property for sale and that the sale was almost due, but as regards the major part of Gretna there was a safeguard in the terms of sale as regards the disposal of the property. The sale was proceeding.

British Phosphate Commission

Mr. Hannon (House of Commons, July 28) asked the Secretary of State for the Colonies whether he could give any approximate estimate of the trading results of the British Phosphate Commission for the year ended June 30, 1924.

The Secretary of State for the Colonies (Mr. Thomas) said that information had been received by telegram that the sales of phosphate rock last year amounted to 450,000 tons, and that the net profit, after allowing for interest and sinking fund, might be roughly estimated at £86,000. The accounts had not yet been made up, and these figures were subject to correction.

Mr. Hannon asked if the House at the first convenient opportunity could be given a full statement of the business proceedings of the Phosphate Commission.

From Week to Week

DR. J. T. CONROY and Mr. F. W. Bain have been appointed additional directors to the board of the United Alkali Co., Ltd.

THE DEGREE OF DOCTOR OF SCIENCE in Chemistry has been conferred by London University on Mr. A. D. Mitchell, an internal student.

THE DEGREE OF DOCTOR OF PHILOSOPHY has been conferred by London University upon Mr. R. C. Johnson, B.A., B.Sc., lecturer in Physics at Belfast University.

MR. FRANK EASTMAN has resigned the position of chairman and managing director of J. Pullar and Sons, dyers, of Perth, but he will remain a director of the company.

CHEMICAL PLANT AND MACHINERY will be sold by auction at the Navigation Chemical Works, Bramwell Street, Broad Oak Road, Parr, St. Helens, on Thursday, August 7.

PROFESSOR A. F. POLLARD, of the Imperial College of Science and Technology, South Kensington, has again been adopted Liberal candidate in the London University by-election.

MR. IFOR C. JONES, B.Sc., of the University of Wales, Aberystwyth, has been elected to a Rhondda research studentship in physics at Gonville and Caius College, Cambridge.

A CHANGE IN ADDRESS is announced by S. Bornett and Co., Ltd., chemical engineers, late of King William Street, London, to 7 and 8, Idol Lane, London, E.C.3, the telephone number now being Royal 1907.

CAPTAIN THE HON. WALTER SAMUELS and Mr. A. Chester Beatty have been appointed directors of the Venezuelan Oil Concessions (Ltd.). Captain Samuels has also been elected chairman of the company.

THE TITLE of Reader in Physical Chemistry in the University has been conferred by London University on Mr. W. E. Garner, M.Sc. (Birmingham and London) in respect of his post at University College.

THE COUNCIL OF WALES UNIVERSITY has awarded a Fellowship to Mr. Glyn Owen. Mr. Owen, of Bangor College, was awarded first-class honours in Chemistry in 1921, and in 1923 gained the M.Sc. degree at the University of Wales.

MR. HENRY PEET, speaking as a magistrate of Liverpool, said on Monday that, in spite of the new regulations which require that methylated spirit shall be made obnoxious to the taste, the demand for it was as great as ever.

THE HEAD OFFICE of the British Petroleum Co., Ltd., distributors of "B.P." petrol, has been transferred from 22, Fenchurch Street, London, to the new premises of the Anglo-Persian Oil Co., Ltd., Britannic House, Moorgate, London, E.C.2.

MR. R. CHILD, research chemist to D. Anderson and Son, Ltd., of Manchester, is stated to have discovered, after three years' research, a method of stabilising bitumen and rendering it fireproof. It is stated to have passed severe tests and to have withstood heat up to 4,000 deg. Fahrenheit.

MR. E. G. BRYANT, B.Sc., (Lond.), pharmaceutical chemist and head of the School of Pharmacy at Robert Gordon's College, Aberdeen, has obtained the degree of Doctor of Pharmacy of the University of Nancy. Dr. Bryant is the first British pharmacist to obtain this degree at Nancy.

THE DEGREE OF PH.D., has been conferred by Bristol University on Abu-Bakr Mohamed Bakr (M.Sc., Bristol), for a dissertation on—(Part I.) "A New Method for the Determination of the Sorption of Vapour by Charcoal"; (Part II.) "Ultrafiltration of Soap Solutions Sodium Oleate and Potassium Laurate."

A SUM OF $18,000 was voted by the New York City Board of Estimate on July 10 to purchase lead arsenate for use in spraying city trees which are infested with caterpillars. The Department of Parks will purchase the arsenate and use it immediately to combat an epidemic of caterpillars in several parks in Brooklyn.

THE SECRETARY FOR MINES gives notice that a type of breathing apparatus, known as the Draeger No. 2 (1921 model) apparatus, manufactured by H. and B. Draeger, Draegerwerk, Luebeck, Germany, has passed the official tests, and that the Board of Trade has decided to approve this type of apparatus for use at rescue stations and mines.

THE RESEARCH DEPARTMENT of the London General Omnibus Co. has been experimenting with an aluminium alloy road wheel, which, although only half the weight of the standard steel wheel, has given exceptionally satisfactory results. A number of these wheels have now performed over 30,000 miles on service, and tests are continuing on upwards of 20 routes.

THE GOVERNMENT, at the instance of the Secretary for Mines and the Research Department, has decided on immediate provision for the rapid development of the chemical and physical survey of the coal seams and to encourage all promising new processes for the carbonisation of coal at low temperatures, which have reached the stage of commercial production.

DR. A. S. WHEELER, of the department of chemistry, North Carolina University, has organised a research into the possibilities of spruce turpentine, normally discarded as waste in pulp mills. He has obtained twelve new dyes, the turpentine being largely composed of cymene, which is used with bromine and coal tar intermediates to produce new colours which have been tested and found fast to light.

THE JOINT DYERS' EXECUTIVE COMMITTEE has, by a resolution, instructed all trade unions concerned to present to their members a report of the negotiations with employers, also that a statement be issued to members explaining the position and asking that a ballot vote be taken of all members affected as to whether the employers' propositions shall be rejected. The decision affects 80,000 workers.

DR. ALBERT HAWORTH, M.B., Ch.B., Manchester, has been appointed lecturer in Chemical Pathology at Leeds University. Dr. Haworth graduated Bachelor of Science with first-class honours in Chemistry at Manchester, and was afterwards awarded the M.Sc. degree. He then took up the study of Medicine and graduated Bachelor of Medicine and Bachelor of Surgery in 1920. He will take up his duties in the University at the beginning of next session.

CLAIMS INCLUDING AN ADVANCE IN WAGES made on behalf of the workers employed in the wholesale drug and chemical trade by the National Drug and Chemical Union were discussed at a conference between representatives of the union and members of the Drug and Fine Chemical Manufacturers' Association held at the Memorial Hall, London, on Tuesday. It was decided to appoint a joint committee of employers and representatives of the union to go into the questions involved and report.

SIR MAX MUSPRATT, accompanied by Lady Muspratt, left Liverpool on July 24 by the White Star liner *Megantic* for Montreal. They will attend the meetings of the British Association at Toronto, and later Sir Max will be present at the annual meeting of the American Chemical Society at Cornell University, where he will speak on "Chemistry and Civilisation." The party will subsequently visit Niagara and the works of the United Alkali Company at Bay City, Michigan, returning *via* Ottawa and Quebec, from whence they sail for Liverpool on September 27.

SIR ERNEST RUTHERFORD, F.R.S., before leaving on Saturday last for the British Association meeting at Toronto, expressed his opinion on the report that a German chemist had succeeded in obtaining gold from mercury by the loss of an atom of helium. He said he was very sceptical as he thought it unlikely that a helium atom could be detached by slow electrons. Gold was a fairly common impurity in small traces in many metals, and a very small quantity only would be required to give the necessary reaction. Sir Ernest Rutherford will deal with the latest researches in atomic disintegration at the Toronto meeting.

THE DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH is about to make a few appointments to the Research Staff of the Fuel Research Station, East Greenwich. Candidates must be Honours Graduates in Chemistry (or have equivalent qualifications) with experience in the technology of fuels; or be Honours Graduates in Engineering (or have equivalent qualifications) with similar experience. Research experience is essential for a higher post in chemistry and industrial experience for a higher post in engineering. Applications must be made on a form to be obtained from the Department, and must be received by the Secretary, Department of Scientific and Industrial Research, 16, Old Queen Street, Westminster, S.W.1, not later than August 20 next.

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ANALYSIS.—The titration of oxalic acid with permanganate. J. M. Kolthoff. *Z. anal. Chem.*, Nos. 5-6, 1924, pp. 185-211.

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Patent Literature

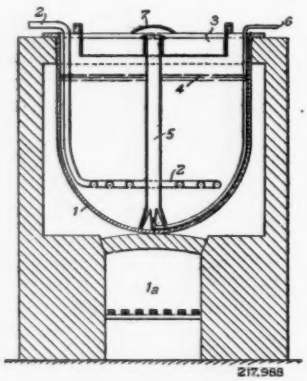
Abstracts of Complete Specifications

217,976. METAL OXIDES AND SIMILAR PRODUCTS, PROCESS FOR PRODUCING. M. Gjersoe, Mankedamsvesen 53B Christiania, Norway. Application date, March 22, 1923.

When distilling raw material such as zinc ore, metallic zinc, or zinc alloys with a reducing agent such as carbon, and then oxidising the distillates such as zinc vapour, the zinc oxide is usually contaminated with carbon which may come from the reducing agent or from the carbon electrodes in the case of electric heating. If the raw material contains sulphur compounds, the zinc white may be contaminated with sulphur. This is avoided by introducing combustible gases into the distillation zone which mix with the vapour and generate sufficient heat by the combustion to burn the combustible impurities by means of the air entering the oxidising chamber. Carbon monoxide is suitable for this purpose, and effects the removal of carbon and sulphur. Reference is directed in pursuance of Section 7, Sub-section 4, of the Patents and Designs Acts, 1907 and 1919, to Specifications No. 165,767, 161,156, 115,870, 9,368/1914, 933/1914, 22,519/1913, 5,438/1913, 4,058/1904, 18,015/1902, 10,953/1902, and 1,149/1880.

217,988. BARIUM PEROXIDE, MANUFACTURE OF. R. Stewart, 46, Westbourne Road, Luton, and B. Laporte, Ltd., Kingsway, Luton. Application date, March 26, 1923.

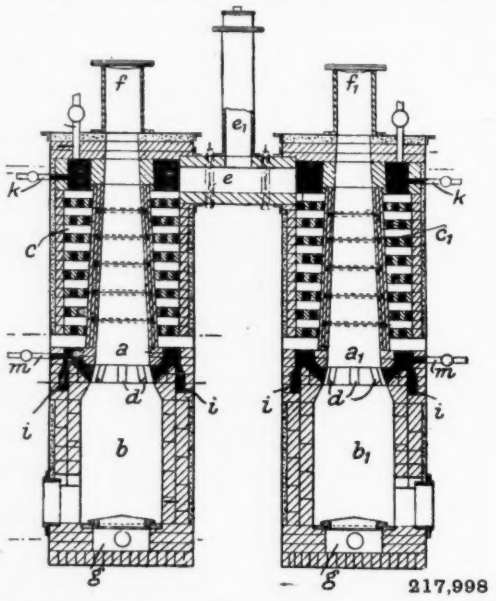
Barium peroxide is made from barium hydroxide by melting the hydroxide and blowing air or oxygen through it.



The agitation of the mass due to the passage of air ensures the continuous oxidation, which would not occur by the passage of air over the molten hydroxide. The barium hydroxide may be melted in a cast iron vessel 1 in a furnace 1a. A strainer 3 is suspended above the level of the liquid 4, and carries a depending pipe 5 slotted at its lower end and surmounted by a deflecting plate 7. Hot compressed air is delivered through a pipe 2, formed into a spiral near the bottom of the vessel 1, and perforated in its under surface. Compressed air is also supplied through a pipe 6, terminating within the slotted end of the pipe 5 to lift the barium hydroxide and peroxide into the strainer 3. The barium peroxide is retained, and the hydroxide returns to the vessel 1. Alternatively, the hydroxide may be contained in a shallow tray on the hearth of a muffle furnace, and the flue of the furnace may surround a tower above one end of the tray. The molten hydroxide is delivered into a strainer at the top of the tower, and returns in a shower to the tray so that it is exposed to the heated air. A second strainer may be interposed near the bottom of the tower to intercept the peroxide which has been formed.

217,998. COMBUSTIBLE GAS, MANUFACTURE OF. C. B. Tully, Millgate, Newark-on-Trent. Application date, March 27, 1923.

Two vertical retorts a, a^1 are arranged above two water gas generators b, b^1, and each is provided with a jacket c, c^1 containing the usual checker work and connected at its lower end through ports d with the interior of the retorts at their junction with the generators. The upper ends of the jackets communicate through a pipe e having a gas outlet e^1. The retorts have valve controlled outlets f, f^1. The base of each generator b, b^1 is provided with three pipes, for admitting air and steam, and for the outlet of gas respectively. Secondary air may be supplied to the jackets through an annular passage i,



and steam may be admitted through pipes k at the top and m at the bottom. The retorts contain coal and the generators contain coke derived from the coal. Air is admitted to the base g of both generators simultaneously, and the resulting blow gas escapes through the ports d into the jackets c, c^1, and thence through the outlet e, e^1. During the blow, the outlet pipes f, f^1 are closed, but they may be opened to draw off the coal gas separately from the blow gas. The air blast is then shut off, and steam admitted to the generator b only. The resulting water gas passes through the ports d into the jackets c, together with coal gas from the retorts, and then through the passage e to the jacket c^1 of the retort a^1. The gas passes through the ports d into that retort, and mixes with the coal gas generated therein so that a mixed water gas and coal gas is drawn off at the outlet f^1. After an interval the generators are blown again and steam is then supplied to the generator b^1 only, to generate water gas. By this method a better gasification of the tar and hydrocarbons is obtained, yielding a richer gas. To produce a gas rich in hydrogen and low in methane and other hydrocarbons, the mixed water gas and coal gas, instead of passing upwards through the second retort, is passed downwards through the corresponding generator to the gas outlet at the bottom, so that the coal gas from the retort also passes downwards through the generator and becomes cracked, yielding hydrogen and methane. The proportion of hydrogen may be increased by injecting oil or other hydrocarbons into the second retort.

218,012. FROTH FLOTATION CONCENTRATION OF ORES AND THE LIKE. Minerals Separation, Ltd., 62, London Wall, London, E.C.2. From Minerals Separation North American Corporation, Ltd., 61, Broadway, New York. Application date, March 20, 1923.

The object is mainly to separate one metalliferous constituent of an ore from another, or to prevent the flotation of iron pyrites. A frothing agent is used which contains a large proportion of aromatic hydrocarbons characterised by the presence of one or more methyl groups. Xylene is found to be a good frothing agent, particularly in concentrating galena free from blende and iron pyrites. Toluene is less effective than xylene, and the higher members of the series, pseudocumene, mesitylene, and cymene, are good frothing

agents, but tend to include blende in the froth with galena. Solvent naphtha is similar in effect to xylene. The frothing agent may also contain a heavy aromatic coal tar derivative such as cresol, or naphthalene, or anthracene, or a derivative, *e.g.*, nitronaphthalene, naphthalene-sulphonic acids, and phthalic acid. When these frothing agents are used with an ore containing iron, it is found that the froth contains a large proportion of other metals such as zinc, and a relatively small proportion of iron.

The process may also be employed to obtain a concentrate rich in copper from an ore containing copper and iron. In the case of an ore containing lead with zinc and/or iron, the concentrate contains a large proportion of the lead and a small proportion of the zinc and iron. If the valuable material of the ore is partly oxidised, these frothing agents may be used to separate first the unoxidised values, and the pulp may then be treated with a sulphidising material and the oxidised constituents recovered by flotation. It is found that a frothing agent consisting of a coal tar derivative in an asphaltic form, carried in an aromatic hydrocarbon, will float lead carbonate from an ore without artificial sulphidisation, and the carbonate rich in silver is floated in preference to the carbonate low in silver. The remainder of the lead may then be floated after sulphidisation. In the case of a lead-zinc-silver ore, it is possible to separate a first concentrate containing the lead and silver low in zinc, and a second concentrate high in zinc and low in silver and lead. If the ore contains iron also, it is possible to obtain lead and zinc concentrates both low in iron and relatively free from one another. Examples are given of the treatment of Broken Hill galena blende, lead carbonate ores, lead-zinc ores, and the separation of coal from pyrites.

218,034. PHENOL AND PHENOLIC BODIES, MANUFACTURE OF. D. Tyrer, Stoneleigh, West Villas, Stockton-on-Tees. Application date, April 12, 1923.

In the fusion process for the manufacture of phenols, the proportion of caustic soda employed is usually 4 molecules to each molecule of the sulphonic acid salt. This excess is employed to prevent the mixture becoming thick when heated to the usual temperature of 290°–300° C. It is now found that if air is excluded from the process, it is possible to heat to a temperature considerably above 300° C., without danger of rapid oxidation, and at this temperature the reaction proceeds to completion when the proportion of caustic soda is 2·2 molecules to each molecule of sulphonic acid salt. The operation may be performed in an atmosphere of hydrogen or nitrogen, or in a closed container which is completely filled, or in a container having only a small outlet for the escape of steam so that an atmosphere of steam is obtained. The small proportion of alkali employed enables the sodium phenolate to be extracted with a quantity of hot water such that most of the sodium sulphite remains undissolved. The sulphite may be mixed dry with benzene sulphonic acid free from sulphuric acid. Dry sodium benzene suphonate is thus obtained, and sulphur dioxide is evolved which may be employed to liberate phenol from the sodium phenolate. The liquor remaining may be used to extract a fresh portion of the product from the heating operation. This liquor gradually accumulates sodium sulphate and sodium benzene sulphonate, which are periodically recovered.

218,053. TREATING GASES FOR REMOVING CARBON DISULPHIDE. South Metropolitan Gas Co., E. V. Evans, and H. Stanier, 709, Old Kent Road, London, S.E.15. Application date, April 28, 1923.

It is found that the activity of nickel catalysts used for purifying coal gas from carbon disulphide is improved by adding 10–30 per cent. of one or more metallic oxides that increase the activity of the metal in promoting the reaction between hydrogen and carbon disulphide. Suitable oxides are those of thorium, chromium, beryllium, or aluminium. A mixture of nickel and 30 per cent. of thoria is capable of treating about three times the volume of gas which could be treated with nickel alone. The temperature may also be about 50° C. lower, so that the decomposition of other carbon compounds is diminished and less carbon is deposited on the catalyst. The mixed catalyst is obtained by heating a mixture of nitrates of nickel and thorium, aluminium, or beryllium, or ammonium bichromate in the case of chromium oxide. The mixed oxides are deposited on a porous support.

218,054. SYNTHETIC RESIN. A. Bau, Hope House, Ramsbottom, Lancs. Application date, April 30, 1923.

The object is to produce a synthetic resin which is less brittle and is more capable of penetrating textile fibres. To produce the resin, a phenol is condensed with formaldehyde, hydrochloric acid, and polyoxy-aldehyde alcohols, so that the formaldehyde and hydrochloric acid forms with the phenol oxybenzyl alcohol which condenses with the polyoxy-aldehyde alcohols to form a glucoside which polymerises to a resin. An example is given in which a mixture of a phenol, formaldehyde, hydrochloric acid, and glucose, is slowly heated to 65°-70° C., when a heavy oil is precipitated. The oil is washed until neutral, and is dried at a temperature below 55° C., forming a resin soluble in alcohol.

218,119. MIXTURE OF LEAD SUBOXIDE AND METALLIC LEAD POWDER, MANUFACTURE OF. G. Shimadzu, 420, Funaya Cho, Higashinotoin Oshikoji Sagaru, Kamikyo Ku, Kyoto, Japan. Application date, July 18, 1923.

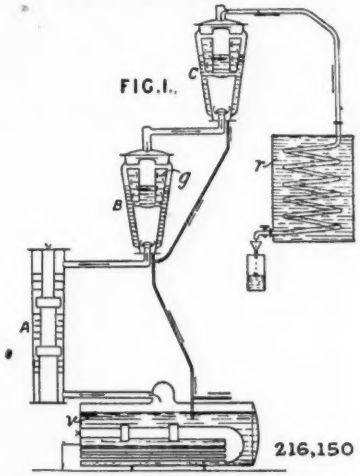
Specification No. 176,924 (see THE CHEMICAL AGE, Vol. VI., p. 525) describes a process for making very fine lead powder by the slow rotation of a drum containing pieces of lead, which are thus subjected to abrasion. In this invention, the drum is heated to 60°-200° C., and air is blown through, so that the surface of the lead is gradually oxidised. The lead suboxide formed is comparatively brittle and is abraded into a very fine powder. The metallic surface thus exposed is again oxidised, and so on. The powder thus obtained is chemically very reactive and is spontaneously converted into litharge on exposure to the air.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: —191,037 (W. Dederich—P. von Ditmar) relating to the treatment of hydrocarbons, particularly crude petroleum, see Vol. VIII, p. 242; 200, 482 (L. J. B. A. Colas, A. P. J. Colas, and L'Alpha Soc. Anon. pour la Fabrikation des Pâtes de Cellulose) relating to treatment of liquor obtained by lixiviating vegetable matter, see Vol. IX, p. 290; 209,722 (J. P. Wibaut) relating to the manufacture of alkyl halides, see Vol. X, p. 277.

International Specifications not yet Accepted

216,150. CRACKING HYDROCARBONS. A. A. F. M. Seigel, 3 bis, Rue Clement Marot, Paris. International Convention date, May 19, 1923.

Crude petroleum, shale oil, fuel oil, gas oil, etc., is vaporized at 350° C. in a still V, and the vapour passes through chips or



turnings of iron, nickel, or copper, which are placed in a centrally heated retort A, heated to 520°–530° C. The vapour then passes to a cooler B, which is cooled by a water jacket under a pressure of 10–12 kg. so as to maintain a temperature of 200°–220° C. The vapour then passes to a similar cooler C, in which the water jacket is at a pressure of 3 kg. and temperature of 135° C. The vapour expands in these coolers, and passes through metal chips on shelves J. A liquid hydrocarbon containing a higher proportion of carbon than gasoline is condensed in a condenser R.

216,478. ACETALDEHYDE-ANILINE COMPOUNDS. Naugatuck Chemical Co., Elm Street, Naugatuck, Conn., U.S.A (Assignees of S. M. Cadwell, 200, Ames Avenue, Leonia, N.J., U.S.A.). International Convention date, May 26, 1923.

A vulcanisation accelerator is obtained from a mixture of slightly more than two molecules of acetaldehyde and one molecule of aniline in presence of water having a hydrogen ion concentration corresponding to $P_H 3$ to $P_H 9$. A concentration of $P_H 4{\cdot}6$ is obtained by a solution of sodium acetate and acetic acid, and gaseous acetaldehyde is absorbed in the solution. Aniline is then added at 40°–50° C. under a reflux condenser, and the upper layer of liquid is drawn off. The mixture is distilled off. Rubber treated with this accelerator and vulcanised has a tensile strength of 2,800–3,000 lb. per sq. in.

216,486. LAKES. Farbenfabriken vorm. F. Bayer & Co., Leverkusen, near Cologne, Germany. International Convention date, May 22, 1923.

Lakes obtained with an acid dyestuff containing amino, and one or more sulpho groups are made more fast to light by the employment of complex acids containing tungsten and molybdenum. Molybdenum phospho-tungstate is obtained by mixing sodium tungstate, molybdate, and phosphate, and concentrated hydrochloric acid is added. Silicic acid may be substituted for the phosphate to obtain silico molybdenum tungstate. To obtain the lakes, examples are given in which a mixture of alumina and a basic dyestuff is precipitated by phosphomolybdenum tungstate.

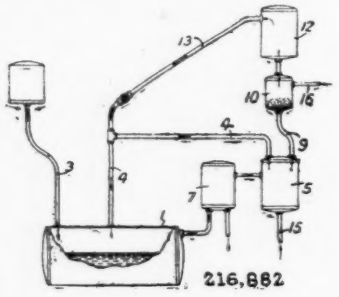
216,527. DYES. Chemische Fabrik Griesheim Elektron, Frankfurt-on-Main, Germany. (Assignees of Farbenfabriken vorm. F. Bayer and Co., Frankfurt-on-Main, Germany). International Convention date, May 22, 1923. Addition to 211,752.

Arylides of 2 : 3-oxynaphthoic acid are coupled with tetrazo compounds of certain diamino-disazo dyestuffs not containing sulphonic groups, to obtain insoluble azo dyes. The diamino-disazo compounds are obtained by coupling a tetrazo compound with a diazotizable amine such as *m*-aminoacetanilide, acetyl-toluylene-diamine, *m*-toluidine, *p*-cresidine, *p*-xylidine, or α-naphthylamine or a derivative coupling in the 4-position. In an example, black lakes are obtained by coupling tetrazotized dianisidine with α-naphthylamine, tetrazotizing, and coupling with 2 : 3-oxynaphthoic anilide. Other examples of dyeing and printing are given.

216,838. DYEING CELLULOSE ESTERS. Farbenfabriken vorm. F. Bayer and Co., Leverkusen, near Cologne, Germany. International Convention date, May 28, 1923.

Cellulose esters or their transformation products are dyed with deeper shades without using protective colloids, by adding a salt of an oxyacid of nitrogen or chlorine to the dye. Suitable salts are aniline nitrate, sodium nitrite, nitrates of ammonium, sodium, magnesium, calcium, or zinc, or of organic bases such as monomethylamine, dimethylamine guanidine, pyridine, or piperidine, and also chlorates. These may be used with dyes such as chrysoidine G, crystal violet P, methylene blue, rhoduline red B, safranine, auramine, or Bismarck brown.

216,882. CRACKING AND HYDROGENATING HYDROCARBON OILS. Internationale Bergin-Compagnie voor Olie en Kolen-Chemie, 11a, Plaats, S'-Gravenhage, Holland. International Convention date, May 31, 1923.



A retort 1 is supplied with hydrogen by a pipe 4 and with oil by a pipe 3, and the oil is cracked and hydrogenated. The vapour passes to a condenser 7 and then to a washer 5 to which petroleum or tar oil is supplied. Some of the gas passes back by a pipe 4 to the retort, and some to a cracking apparatus 10 in which methane and ethylene are decomposed to obtain hydrogen. The gas then passes to another washer 12, and then by a pipe 13 back to the retort 1. Coke oven gases may also be supplied to the system through the pipes 15, 16.

LATEST NOTIFICATIONS

219,276. Manufacture of a thionaphthisatin and its intermediate products. Soc. of Chemical Industry in Basle. July 18, 1923.
219,277. Manufacture of caoutchouc, guttapercha, balata, and analogous vegetable resins. K.D.P., Ltd. July 17, 1923.
219,280. Manufacture of indigoid dyestuffs. Soc. of Chemical Industry in Basle. July 18, 1923.
219,299. Manufacture of new azo dyestuffs. Farbenfabriken vorm. F. Bayer and Co. July 18, 1923.
219,304. Manufacture of acylated diamines. Soc. of Chemical Industry in Basle. July 17, 1923.
219,322. Purification of oils. Tausz, Dr. J. July 16, 1923.
219,327. Process for separating hafnium and zirconium. Naamlooze Vennootschap Philips' Gloeilampenfabrieken. July 18, 1923.

Specifications Accepted with Date of Application

209,742. Alloys poor in carbon and silicon, Process for the production of. Aktiebolaget Ferrolegeringar. January 11, 1923.
213,524. Alloys containing tungsten carbide, Manufacture of. General Electric Co., Ltd. March 29, 1923.
218,401. Manures. M. Igawa and Asahi Garasu Kabashiki Kaisha. December 21, 1922.
218,694. Concentrated sulphuric acid, Production of. A. W. Cowburn. January 10, 1923.
218,723. Heating liquids by introduction into molten metal. Thermal, Industrial and Chemical (T.I.C.) Research Co., Ltd., D. Rider, and J. S. Watts. April 7, 1923. Addition to 170,617.
218,747. Kaolin and the like, Bleaching of. R. F. B. Gaudin, and Dartmoor China Clay Co., Ltd. April 12, 1923.
218,793. Articles of the phenol formaldehyde condensation product type, Process for. Indurit Products Co., Ltd., and J. G. Fairgrieve. May 15, 1923.
218,802. Retort furnace. C. V. McIntire. May 22, 1923.
218,807. Heat treatment of materials, Apparatus for. Thermal Industrial and Chemical (T.I.C.) Research Co., Ltd., and D. Rider. June 4, 1923. Addition to 174,974.
218,854. Accelerating the vulcanisation of caoutchouc and of products for use therein. British Dyestuffs Corporation, Ltd., V. Lefebure, and A. J. Hailwood. July 26, 1923.
218,910. Oils and fats, Process and apparatus for removing odoriferous substances from. H. Bollmann. November 19, 1923.
218,925. Carbonisation of coal, and the production of high-grade gas. J. Rude. December 18, 1923.

Applications for Patents

Badische Anilin- and Soda-Fabrik and Johnson, J. Y. Production of diazo compounds. 17,439. July 21.
Brimley, F. J., Dickenson, T., and Nigerian Products, Ltd. Extraction of oil from palm fruit, etc. 17,378. July 21.
Brown, L., and Macintosh and Co., Ltd. Tanks. 17,853. July 26.
Brown, Lenox and Co. (London), Ltd., Ellis, A. J. J., and Lennox, H. Manufacture of tanks. 17,643. July 23.
Busch, A., and Wulfing, J. A. von. Manufacture of acid calcium lactate. 17,645. July 23.
Fritzsche, H., and Society of Chem. Industry in Basle. Manufacture of substantive azo-dyestuffs. 17,545. July 22.
Hutchins, T. W. S. Electrodeposition of metals. 17,715. July 24.
Jones, J. I. M., Morton, J., Morton Sundour Fabrics, Ltd., and Wylam, B. Dyes and dyeing. 17,807. July 25.
Knecht, E. Production of diazo and nitroso compounds. 17,862. July 26.
Meyerhofer, A. F. Production of hydrofluosilicic acid. 17,722. July 24. (Germany, October 1, 1923.)
Meyerhofer, A. F. Production of soluble carbonates or hydroxides from insoluble carbonates, oxides, or hydroxides. 17,723. July 24. (Germany, August 2, 1923.)
Parker, C. H., and Jones, F. W. S. Distillation of coal, etc. 17,454. July 21.
Pieters, J. Continuous furnace for distillation of lignite, etc. 17,621. July 23. (France, July 23, 1923.)
Potts, H. E., and Zeche M. Stinnes. Purification of crude ammoniacal liquors. 17,742. July 25.
Sutcliffe, E. R. Distillation of carbonaceous substances. 17,640. July 23.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing those firms' independent and impartial opinions.

London, July 31, 1924.

A FAIR amount of activity has been in evidence in the market during the past week, and, having regard to the time of the year, the volume of business must be regarded as fairly satisfactory. Export market is quiet.

General Chemicals

ACETONE.—One or two cheaper parcels have offered for spot delivery and this has reacted upon the spot price. The set-back is, however, to be regarded as purely temporary, the forward price being firm and advancing. The price-to-day is £98 per ton ex wharf.

ACID ACETIC is weak and the tendency is in buyers' favour. Technical is £43 10s., carriage paid. Pure £43 per ton ex wharf.

ACID CITRIC is lifeless at 1s. 5½d. to 1s. 6d. less 5%.

ACID FORMIC is in fair demand and the improvement in the tone has been maintained; 85% is quoted at £55 10s. per ton carriage paid.

ACID LACTIC is featureless, and price is unchanged at £37 to £39 per ton for the 50% vol.

ACID OXALIC.—The market has improved and there is an indication that prices are likely to advance. The spot price is 4½d. per lb. ex wharf.

ACID TARTARIC is inquired for. English makers quote 1s. 1½d. less 5%, but foreign is offered considerably cheaper.

ALUM.—The foreign make is offered as low as £8 15s. per ton c.i.f. to arrive.

ARSENIC is without special feature. Price about £45 per ton.

BARIUM CHLORIDE is in good demand for export at £13 10s. to £14 10s. per ton and is firming up.

COPPER SULPHATE.—Unchanged.

CREAM OF TARTAR is a little weaker due to realisations of one or two weak holders. Price 81s. 6d. per cwt. less 2½%.

CALCIUM CHLORIDE is in fair demand at £5 per ton.

EPSOM SALTS.—The market is controlled by stocks at £4 15s. to £5 per ton, higher prices being quoted for forward.

FORMALDEHYDE is weak and in poor demand. Price nominally £54 per ton.

LEAD ACETATE is a little cheaper, foreign make offering at £47 per ton.

LIME ACETATE.—The market is lifeless. Price is sagging and seems likely to go lower.

POTASSIUM CARBONATE is very quiet at £23 10s. per ton.

POTASSIUM BICHROMATE.—Foreign make is offering slightly below the English makers' prices. Price nominally is 5½d. less 5%.

POTASSIUM PRUSSIATE is in some demand for export. Spot price is about 7½d. per lb.

SODIUM ACETATE is in good demand. Price £24 per ton.

SODIUM BICHROMATE.—A good deal of foreign make is offered slightly undercutting the English price. Market is nominally 4½d. less 5%.

SODIUM HYPOSULPHITE.—Unchanged at £9 15s. to £10 per ton.

SODIUM NITRITE is in good demand and is quoted at £26 10s. per ton.

SODIUM PRUSSIATE is a little more interesting and business has been done at a little over 4d. per lb.

SODIUM SULPHIDE.—Without special feature. Price about £14 per ton.

Coal Tar Products

There is no marked change in the market for coal tar products since last week.

90% BENZOL is quoted at from 1s. 6d. to 1s. 6½d. per gallon on rails.

PURE BENZOL is stationary at 1s. 11d. per gallon on rails.

CREOSOTE OIL remains weak, and is offered at from 5¾d. to 6d. per gallon on rails in the North, while the price in London is about 6½d. to 6¾d. per gallon.

CRESYLIC ACID remains steady, the 97/99% quality being quoted at 2s. 0½d. to 2s. 1d. per gallon, f.o.r., while the Dark 95/97% is quoted at 1s. 9d. per gallon on rails.

SOLVENT NAPHTHA is a little firmer, and is being quoted at 11½d. to 1s. per gallon on rails.

HEAVY NAPHTHA is worth from 1s. to 1s. 1d. per gallon on rails.

NAPHTHALENES.—There is no change to report. Supplies of all kinds are still plentiful, the 76/78 quality being obtainable at about £7 to £7 10s. per ton, 74/76 quality at about £6 per ton. Low grades are rather more plentiful, and are quoted at £4 10s. to £5 per ton.

PITCH.—Little interest is shown in next season's business, and prices are more or less nominal at 57s. 6d. to 60s. f.o.b. London, 55s. to 57s. 6d. f.o.b. East and West coast ports.

Sulphate of Ammonia

SULPHATE OF AMMONIA.—There is a better demand from abroad and prices are rather firmer.

Nitrogen Products Market

OUR last report regarding the position of nitrogen market is confirmed, since when there has been no alteration in prices for export to Spain or Canary Islands, and the f.o.b. value of shipment to the Colonies remains firm at £13 to £13 5s. per ton.

There is no change to report in the Home Agricultural position.

With regard to nitrate of soda, the market still continues weak, the price for spot delivery being £11 10s. per ton c.i.f. chief European ports.

Zinc Chloride for Wood Preservation

FROM the results already obtained there would seem to be a great future for zinc chloride in wood preservation. In one case, according to the *Manchester Guardian Commercial*, railway sleepers treated with this solution have been in use for twenty years and still look as good as new, while even better results are promised by the addition of petroleum to zinc chloride. In many of the sleepers so treated subsequent examination has revealed no trace of chlorine, though many chemists incline to the theory that chlorine is the absolute factor in the preservation of wood by zinc chloride. Objections have often been made that treatment with this solution would result in the staining of the subsequent film of paint, but experiments do not support this objection, many painted wooden panels, zinc chloride treated, still preserving their colour after two years' service. Previous failures of this process are probably due to the fact that very careful chemical and physical control has to be exercised, not only during the process of treatment with zinc chloride, but also in the subsequent handling of the material.

Utilisation of Anhydrite

AN investigation of the properties of anhydrite is proposed by the U.S. Bureau of Mines. One of the problems to be investigated is the utilisation of anhydrite as a retarder in cement in place of gypsum. It is at present widely believed that anhydrite is unsuitable for this purpose, but convincing evidence is lacking, and the bureau proposes to determine whether this belief is based upon a sound scientific foundation. In working out gypsum deposits, it is generally found that the percentage of anhydrite in the gypsum increases with the depth of mine. This materially shortens the life of a property and, of course, increases operating costs materially. It is, therefore, proposed to determine whether there are not practicable commercial methods for hydration of anhydrite to form either gypsum ($CaSO_4 . 2H_2O$) or plaster of paris ($CaSO_4 . \frac{1}{2}H_2O$) from the anhydrite ($CaSO_4$). Work on this problem is only now being considered, so that it will be some time before the bureau has any conclusions for publication.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at sellers' works.

General Heavy Chemicals

All grades of Boric Acid have been reduced by £3 per ton as from June 11. Borax prices remain unchanged. Prices remain generally steady.

Acid Acetic 40% Tech.—£23 10s. per ton.
Acid Boric, Commercial.—Crystal, £45 per ton. Powder, £47 per ton
Acid Hydrochloric.—3s. 9d. to 6s. per carboy d/d., according to purity, strength and locality.
Acid Nitric 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.
Acid Sulphuric.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 65s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
Ammonia Alkali.—£6 15s. per ton f.o.r. Special terms for contracts.
Bleaching Powder.—Spot, £11 d/d.; Contract, £10 d/d. 4 ton lots.
Bisulphite of Lime.—£7 per ton, packages extra.
Borax, Commercial.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)
Calcium Chloride.—£5 17s. 6d. per ton d/d.
Methylated Spirit 64 O.P.—Industrial, 3s. 1d. to 3s. 5d. per gall. Mineralised, 4s. 2d. to 4s. 6d. per gall., in each case according to quantity.
Potash Caustic.—£30 to £33 per ton.
Potassium Bichromate.—5¾d. per lb.
Potassium Chlorate.—3d. to 4d. per lb.
Salammoniac.—£32 per ton d/d.
Salt Cake.—£3 10s. per ton d/d.
Soda Caustic, Solid.—Spot lots delivered, £16 7s. 6d. to £19 7s. 6d. per ton, according to strength; 20s. less for contracts.
Soda Crystals.—£5 5s. to £5 10s. per ton ex railway depots or ports.
Sodium Acetate 97/98%.—£24 per ton.
Sodium Bicarbonate.—£10 10s. per ton carr. paid.
Sodium Bichromate.—4½d. per lb.
Sodium Bisulphite Powder 60/62%.—£18 to £19 per ton according to quantity, f.o.b., 1-cwt. iron drums included.
Sodium Chlorate.—3d. per lb.
Sodium Nitrate refined 96%.—£13 5s. to £13 10s. per ton, ex Liverpool. Nominal.
Sodium Nitrite 100% basis.—£27 per ton d/d.
Sodium Sulphide conc. 60/65.—About £14 10s. per ton d/d.
Sodium Sulphide Crystals.—£9 per ton d/d.
Sodium Sulphite, Pea Crystals.—£15 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

Prices in this section show some irregularity, according to district. In the north-eastern counties, for instance, anthracene oil, solvent naphtha, and naphthalenes are cheaper than in Lancashire or London. On the other hand, crude carbolic and creosote are dearer.

Acid Carbolic Crystals.—6½d. to 6¾d. per lb. Quiet. Crude 60's, 1s. 9d. to 1s. 11d. per gall., according to district. Still quiet.
Acid Cresylic 97/99.—2s. 1d. to 2s. 2d. per gall. Demand still good. Market firm. Pale 95%, 1s. 10d. to 1s. 11d. per gall. Steady demand. Dark, 1s. 10d. to 1s. 11d. per gall. Steady business.
Anthracene Paste 40%.—4d. per unit per cwt. Nominal price. No business.
Anthracene Oil, Strained.—8½d. to 9½d. per gall. Quiet. Unstrained, 7½d. to 8½d. per gall.
Benzol.—Crude 65's.—10½d. to 1s. per gall., ex works in tank wagons. Standard Motor, 1s. 4½d. to 1s. 6d. per gall., ex works in tank wagons. Pure, 1s. 8½d. to 1s. 10d. per gall., ex works in tank wagons.
Toluol.—90%, 1s. 5½d. per gall. Pure, 1s. 8d. to 2s. per gall.
Xylol Commercial.—2s. 3d. per gall. Pure, 3s. 3d. per gall.
Creosote.—Cresylic, 20/24%, 9d. to 9½d. per gall. Few inquiries. Middle Oil, Heavy, 5½d. to 6d. per gall. in Lancashire. Standard specification, 6d. to 7d. per gall. in Yorkshire.
Naphtha.—Crude, 8d. to 9d. per gall. Solvent 90/160, 1s. 1d. to 1s. 4d. per gall., according to district. Quiet. Solvent 90/190, 1s. 1d. to 1s. 4d. per gall. Quiet.
Naphthalene Crude.—Drained Creosote Salts, £4 to £6 10s. per ton. Quiet. Whizzed or hot pressed, £9 per ton. Little business.
Naphthalene.—Crystals and Flaked, £13 to £16 per ton in Yorkshire and London respectively. More inquiries.
Pitch.—Medium soft, 55s. to 60s. per ton, f.a.s. for next season. Frequent inquiries.
Pyridine.—90/160, 19s. per gall. Market less firm. Heavy, 12s. to 12s. 6d. Little business.

Intermediates and Dyes

There has been a fair demand for dyestuffs during the past week. Prices remain constant. A number of intermediate products have been reduced in price.

In the following list of Intermediates delivered prices include packages except where otherwise stated.

Acetic Anhydride 95%.—1s. 7d. per lb.
Acid H.—4s. per lb. 100% basis d/d.
Acid Naphthionic.—2s. 4d. per lb. 100% basis d/d
Acid Neville and Winther.—5s. 8d. per lb. 100% basis d/d.
Acid Salicylic, technical.—1s. 1d. per lb. Improved demand.
Acid Sulphanilic.—9½d. per lb. 100% basis d/d.
Aluminium Chloride, anhydrous.—1s. per lb. d/d.
Aniline Oil.—7¾d. to 8½d. per lb. naked at works.
Aniline Salts.—7¾d. to 9d. per lb. naked at works.
Antimony Pentachloride.—1s. per lb. d/d.
Benzidine Base.—4s. 6d per lb. 100% basis d/d.
Benzyl Chloride 95%.—1s. 1d. per lb.
p-Chlorphenol.—4s. 3d. per lb. d/d.
p-Chloraniline.—3s. per lb. 100% basis.
o-Cresol 19/31° C.—4½d. per lb. Demand steady.
m-Cresol 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
p-Cresol 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
Dichloraniline.—2s. 3d. to 3s. per lb.
Dichloraniline S. Acid.—2s. 6d. per lb. 100% basis.
p-Dichlorbenzol.—£85 per ton.
Diethylaniline.—4s. 7d. per lb. d/d., packages extra, returnable.
Dimethyaniline.—2s. 4d. per lb. d/d. Drums extra.
Dinitrobenzene.—9d. per lb. naked at works.
Dinitrochlorbenzol.—£84 10s. per ton d/d.
Dinitrotoluene.—48/50° C. 8d. to 9d. per lb. naked at works. 66/68° C. 1s. 2d. per lb. naked at works.
Diphenylaniline.—2s. 11d. per lb. d/d.
Monochlorbenzol.—£63 per ton.
B-Naphthol.—1s. 1d. per lb. d/d.
a-Naphthylamine.—1s. 4½d. per lb. d/d.
B-Naphthylamine.—4s. per lb. d/d.
m-Nitraniline.—5s. 3d. per lb. d/d.
p-Nitraniline.—2s. 3½d. per lb. d/d.
Nitrobenzene.—5¼d. to 5½d. per lb. naked at works.
o-Nitrochlorbenzol.—2s. per lb. 100% basis d/d.
Nitronapthalene.—11d. per lb. d/d.
p-Nitrophenol.—1s. 9d. per lb. 100 % basis d/d.
p-Nitro-*o*-amido-phenol.—4s. 6d. per lb. 100% basis.
m-Phenylene Diamine.—4s. per lb. d/d.
p-Phenylene Diamine.—10s. 3d. per lb. 100% basis d/d.
R. Salt.—2s. 6d. per lb. 100% basis d/d.
Sodium Naphthionate.—2s. 3d. per lb. 100% basis d/d.
o-Toluidine.—8½d. per lb.
p-Toluidine.—3s. 6d. per lb. naked at works.
m-Toluylene Diamine.—4s. 3d. per lb. d/d.

Wood Distillation Products

All prices keep fairly stable, but there is room for improvement in business.

Acetate of Lime.—Brown, £14 10s. per ton d/d. Demand active. Grey, £19 to £20 per ton. Fair demand. Liquor, 9d. per gall. 32° Tw.
Charcoal.—£7 5s. to £9 per ton, according to grade and locality. Demand below normal.
Iron Liquor.—1s. 7d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.
Red Liquor.—10d. to 1s. per gall. 14/15° Tw.
Wood Creosote.—2s. 7d. per gall. Unrefined.
Wood Naphtha, Miscible.—5s. per gall. 60% O.P. Market dull. Solvent, 5s. 6d. per gall. 40% O.P. Fairly good demand.
Wood Tar.—£5 per ton.
Brown Sugar of Lead.—£46 per ton.

Rubber Chemicals

Antimony Sulphide.—Golden, 5¾d. to 1s. 4d. per lb., according to quality. Crimson, 1s. 3d. to 1s. 6d. per lb., according to quality.
Arsenic Sulphide, Yellow.—1s. 11d. per lb.
Barytes.—£3 10s. to £6 15s. per ton, according to quality.
Cadmium Sulphide.—3s. 9d. per lb.
Carbon Bisulphide.—£24 to £26 per ton, according to quantity.
Carbon Black.—7d. per lb., ex-wharf. Dearer.
Carbon Tetrachloride.—£56 per ton, drums free.
Chromium Oxide, Green.—1s. 3d. per lb.
Indiarubber Substitutes, White and Dark.—4¾d. to 6½d. per lb. Demand very brisk. Prices likely to remain steady owing to firmness of rapeseed oils.
Lamp Black.—45s. per cwt., barrels free.

Lead Hyposulphite.—7½d. per lb.
Lithopone, 30%.—£22 10s. per ton.
Mineral Rubber "Rubpron."—£15 10s. per ton f.o.r. London.
Sulphur.—£10 to £12 per ton, according to quality.
Sulphur Chloride.—3d. per lb., carboys extra.
Thiocarbanilide.—2s. 6d. per lb.
Vermilion, Pale or Deep.—4s. 10d. per lb.
Zinc Sulphide.—7½d. to 1s. 8d. per lb., according to quality.

Pharmaceutical and Photographic Chemicals

The demand for Pharmaceutical Chemicals is better for export to the British Dominions than for the Home Trade.

Acid, Acetic 80% B.P.—£45 per ton.
Acid, Acetyl Salicylic.—3s. 2d. to 3s. 5d. according to quality. Good demand. Price firm.
Acid, Benzoic B.P.—3s. 6d. per lb. Larger supplies available.
Acid, Boric B.P.—Crystal £51 per ton, Powder £55 per ton. Carriage paid any station in Great Britain.
Acid, Camphoric.—10s. to 21s. per lb.
Acid, Citric.—1s. 6d. to 1s. 6½d per lb., less 5% for ton lots. Business subnormal.
Acid, Gallic.—3s. per lb. for pure crystal.
Acid, Pyrogallic, Crystals.—7s. per lb. for 1 cwt. lots. Market firm.
Acid, Salicylic.—1s. 6d. to 1s. 8d. per lb. Low prices have stimulated more inquiry.
Acid, Tannic B.P.—3s. per lb. Market quiet.
Acid, Tartaric.—1s. 1½d. per lb., less 5%.
Amidol.—9s. per lb. d/d.
Acetanilide.—2s. 1d. to 2s. 3d. per lb. for quantity. Demand slow.
Amidopyrin.—13s. 3d. per lb. Neglected. Stocks low.
Ammonium Benzoate.—3s. 3d. to 3s. 6d. per lb. according to quantity.
Ammonium Carbonate B.P.—£37 per ton.
Atropine Sulphate.—12s. 6d. per oz. for English make.
Barbitone.—15s. per lb. Quiet market.
Benzonaphthol.—5s. 3d. per lb. Small inquiry.
Bismuth Salts.—A steady market. Prices according to quantity.
Bismuth Carbonate.—12s. 9d. to 14s. 9d. per lb.
Bismuth Citrate.—11s. 4d. to 13s. 4d. per lb.
Bismuth Salicylate.—10s. 2d. to 12s. 2d. per lb.
Bismuth Subnitrate.—10s. 9d. to 12s. 9d. per lb.
Borax B.P.—Crystal £29, Powder £30 per ton. Carriage paid any station in Great Britain.
Bromides.—Potassium, 10d. per lb.; sodium, 11d. per lb.; ammonium, 1s. per lb. Unsettled. Spot supplies short, raw materials dearer, market advancing.
Calcium Lactate.—Demand active. Good English make can be had from 1s. 7d. to 2s. 6d. per lb.
Chloral Hydrate.—3s. 10d. to 4s. per lb. Very firm and scarce.
Chloroform.—2s. per lb. for cwt. lots. Very steady.
Creosote Carbonate.—6s. 6d. per lb. Little demand.
Formaldehyde.—£54 per ton, ex works. English make in casks. About 8s. per cwt. extra for carboys.
Glycerophosphates.—Fair business passing. Calcium, soluble and citrate free, 7s. per lb.; iron, 8s. 9d. per lb.; magnesium, 9s. per lb.; potassium, 50%, 3s. 6d. per lb.; sodium, 50%, 2s. 6d. per lb.
Guaiacol Carbonate.—10s. 6d. to 11s. 3d. per lb.
Hexamine.—3s. 6d. per lb. for English make. Market quiet and steady.
Homatropine Hydrobromide.—30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydroquinone.—4s. 3d. per lb. in cwt. lots. Foreign make.
Hypophosphites.—Calcium, 3s. 6d. per lb. for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
Iron Ammonium Citrate B.P.—2s. 1d. to 2s. 5d. per lb., according to quantity.
Magnesium Carbonate.—Light Commercial, £36 per ton net.
Magnesium Oxide.—Light Commercial, £75 per ton, less 2½%; Heavy Commercial, £26 per ton, less 2½%; Heavy Pure, 1s. 6d. to 2s. per lb., according to quantity. Steady market.
Menthol.—A.B.R. recrystallised B.P., 50s. per lb. Weaker. Synthetic, 26s. to 35s. per lb., according to quantity. English make. Strong demand.
Mercurials.—Market flat. Red oxide, 5s. 3d. to 5s. 4d. per lb.; Corrosive sublimate, 3s. 6d. to 3s. 7d. per lb.; white precipitate, 4s. 7d. to 4s. 8d. per lb.; Calomel, 3s. 11d. to 4s. per lb.
Methyl Salicylate.—1s. 10d. to 2s. 3d. per lb. for carboys. Tendency weak.
Methyl Sulphonel.—26s. per lb.
Metol.—11s. per lb. British make.
Morphine and Salts.—Reduced by 1s. to 1s. 3d. per oz.
Paraformaldehyde.—2s. 10½d. to 3s. per lb. Not very active.
Paraldehyde.—1s. 5d. to 1s. 6d. per lb. in free bottles and cases.
Phenacetin.—6s. to 6s. 3d. per lb. Price and demand steady.
Phenazone.—7s. 3d. to 7s. 6d. A shade firmer. Forward prices higher.
Phenolphthalein.—6s. 6d. per lb. Ample supplies.
Potassium Bitartrate 99/100% (Cream of Tartar).—88s. per cwt. less 2½% for ton lots. Firm market. Prices have upward tendency.
Potassium Citrate.—1s. 10d. to 2s. 2d. per lb. Dearer.
Potassium Iodide.—16s. 8d. to 17s. 5d. per lb., according to quantity. Demand continues heavy..
Potassium Metabisulphite.—7½d. per lb., 1-cwt. kegs included.
Potassium Permanganate.—B.P. crystals, 7d. per lb., carriage paid; commercial, 8d. to 8½d. per lb., carriage paid. Keen competition keeps prices low.
Quinine Sulphate.—2s. 3d. per oz., in 100 oz. tins. Very heavy demand.
Resorcin.—5s. 6d. to 5s. 9d. per lb. Firmer. Scarce.
Saccharin.—63s. per lb. in 50-lb. lots.
Salol.—3s. 6d. to 3s. 11d. per lb.
Silver Proteinate.—9s. 6d. per lb.
Sodium Benzoate, B.P.—2s. 9d. per lb. Ample supplies B.P. quality available.
Sodium Citrate, B.P.C., 1923.—1s. 11d. to 2s. 2d. per lb., according to quantity.
Sodium Hypophosphite, Photographic.—£13 to £15 per ton. according to quantity, d/d. consignee's station in 1-cwt. kegs.
Sodium Metabisulphite Crystals.—37s. 6d. to 60s. per cwt., net cash, according to quantity.
Sodium Nitroprusside.—16s. per lb. Less for quantity.
Sodium Potassium Tartrate (Rochelle Salt).—75s. to 82s. 6d. per cwt., according to quantity. Market steady, good demand.
Sodium Salicylate.—Powder, 2s. 2d. to 2s. 4d. per lb. Crystal, 2s. 4d. to 2s. 6d. per lb. Flake, 2s. 9d. lb. Market more active.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb., according to quantity.
Sodium Sulphite, anhydrous, £27 10s. to £28 10s. per ton, according to quantity, 1 cwt. kegs included. In large casks £1 per ton less.
Thymol.—18s. per lb. Very scarce indeed, still rising. Forward quotations 22s. per lb.

Perfumery Chemicals

Acetophenone.—12s. 6d. per lb.
Aubepine.—15s. 3d. per lb. Advanced.
Amyl Acetate.—2s. 9d. per lb.
Amyl Butyrate.—6s. 9d. per lb.
Amyl Salicylate.—3s. 3d. per lb.
Anethol (M.P. 21/22° C.).—4s. 6d. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. 10½d. per lb.
Benzyl Alcohol free from Chlorine.—2s. 10½d. per lb.
Benzaldehyde free from Chlorine.—3s. 6d. per lb.
Benzyl Benzoate.—3s. 6d. per lb.
Cinnamic Aldehyde Natural.—16s. per lb. Advanced.
Coumarin.—20s. per lb.
Citronellol.—17s. per lb. Again advanced.
Citral.—10s. per lb.
Ethyl Cinnamate.—13s. 6d. per lb. Cheaper.
Ethyl Phthalate.—3s. 3d. per lb.
Eugenol.—11s. per lb. Advanced.
Geraniol (Palmarosa).—35s. per lb.
Geraniol.—11s. to 18s. 6d. per lb.
Heliotropine.—7s. 9d. per lb. Advanced
Iso Eugenol.—15s. 9d. per lb.
Linalol ex Bois de Rose.—26s. per lb.
Linalyl Acetate.—26s. per lb.
Methyl Anthranilate.—9s. 6d. per lb.
Methyl Benzoate.—6s. per lb.
Musk Ambrette.—45s. per lb. Cheaper.
Musk Xylol.—14s. 6d. per lb. Cheaper.
Nerolin.—4s. 9d. per lb. Advanced.
Phenyl Ethyl Acetate.—15s. per lb. Advanced.
Phenyl Ethyl Alcohol.—16s. per lb.
Rhodinol.—57s. 6d. per lb.
Safrol.—1s. 10d. per lb.
Terpineol.—2s. 4d. per lb. Cheaper.
Vanillin.—25s. 6d. per lb.

Essential Oils

Almond Oil, Foreign S.P.A.—15s. 6d. per lb.
Anise Oil.—2s. 8d. per lb.
Bergamot Oil.—19s. 6d. per lb.
Bourbon Geranium Oil.—36s. 6d. per lb.
Camphor Oil.—75s. per cwt.
Cananga Oil, Java.—10s. 6d. per lb.
Cinnamon Oil, Leaf.—6½d. per oz.
Cassia Oil, 80/85%.—8s. 9d. per lb. Cheaper.
Citronella Oil.—Java, 85/90%, 5s. 8d. per lb. Cheaper. Ceylon, 3s. 7d. per lb.
Clove Oil.—7s. 6d. per lb.
Eucalyptus Oil, 70/75%.—2s. per lb.
Lavender Oil.—French 38/40% Esters, 29s. per lb.
Lemon Oil.—3s. per lb.
Lemongrass Oil.—3d. per oz.
Orange Oil, Sweet.—13s. per lb.
Otto of Rose Oil.—Bulgarian, 35s. per oz. Anatolian, 26s per oz.
Palma Rosa Oil.—19s. per lb.
Peppermint Oil.—Wayne County, 21s. per lb. Japanese, 14s. 3d. per lb.
Petitgrain Oil.—9s. 3d. per lb. Cheaper.
Sandal Wood Oil.—Mysore, 26s. 6d. per lb. Australian, 21s. per lb.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, July 30, 1924.

THERE has been a rather better tone in the heavy chemical market during this past week, better inquiry being received both for home and export. Acetic acid is still on the decline, but prices of most other chemicals are about the same as last reported.

Industrial Chemicals

ACID ACETIC.—Glacial, 98/100%, now quoted £58 to £69 per ton; 80% pure, £45 to £48 per ton; 80% technical, £43 15s. to £45 per ton. All packed in casks delivered c.i.f. U.K. ports, duty free.

ACID BORACIC.—Crystal or granulated, £45 per ton powdered, £47 per ton, carriage paid U.K. stations, minimum ton lots.

ACID CARBOLIC, ICE CRYSTALS.—Rather better inquiry. Now quoted 6¾d. per lb. f.o.b. U.K. port.

ACID CITRIC, B.P. CRYSTALS.—Unchanged at about 1s. 6½d. per lb. less 5% ex store, spot delivery. Offered for early delivery from the continent at 1s. 5¾d. per lb., less 5% ex wharf.

ACID FORMIC, 85%.—Moderate inquiry and price unchanged at about £56 per ton ex store, spot delivery. Offered from the continent at £54 10s. per ton ex wharf, prompt shipment.

ACID HYDROCHLORIC.—In little demand, price 6s. 6d. per carboy ex works.

ACID NITRIC—80°, £23 10s. per ton ex station, full truck loads.

ACID OXALIC.—In little demand and price unchanged at about 4¼d. per lb. ex store. Offered from the continent at 4d. per ton c.i.f. U.K. port.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton ex works, full truck loads. De-arsenicated quality 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Now quoted 1s. 1½d. per lb., less 5% ex store, spot delivery. Offered from the continent at 1s. 1d. per lb. less 5% ex wharf, prompt shipment.

ALUMINA SULPHATE.—17/18%, iron free. Now quoted £7 17s. 6d. per ton ex store, spot delivery. Offered for early delivery from the continent at £7 5s. per ton c.i.f. U.K. port.

ALUM CHROME.—Moderate inquiry. Ammonium chrome alum quoted £20 to £22 per ton according to quality, f.o.b. U.K. port. Potash chrome alum, about £26 per ton ex store.

ALUM POTASH (LUMP).—Spot lots of continental material on offer at £9 5s. per ton, ex store. English material for export quoted £9 7s. 6d. f.o.b. U.K. port.

AMMONIA, ANHYDROUS.—Rather better inquiry. Quoted 1s. 6d. per lb. ex station. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton; packed in 5 cwt. casks delivered U.K. port.

AMMONIA LIQUID 880°.—Unchanged at 2½d. to 3d. per lb. delivered, according to quantity. Containers extra.

AMMONIA MURIATE.—Grey galvanizers quality unchanged at £30 per ton ex station. Fine white crystals now offered from the continent at £25 per ton c.i.f. U.K. port, prompt shipment.

ARSENIC, WHITE POWDERED.—Rather better inquiry. Spot lots quoted £51 per ton ex store.

BARIUM CARBONATE, 98/100%.—Offered from the continent at £11 10s. per ton c.i.f. U.K. port.

BARIUM CHLORIDE, 98/100%.—English material on offer at £14 per ton ex store. Spot delivery. Continental quoted £13 7s. 6d. per ton c.i.f. U.K. port.

BARYTES.—Finest English white quoted £5 5s. per ton ex works; continental about £5 per ton c.i.f. U.K. port.

BLEACHING POWDER.—Spot lots £11 per ton ex station, contracts 20s. per ton less.

BORAX.—Granulated, £24 10s. per ton; crystals, £25 per ton; powdered, £26 per ton, carriage paid U.K. stations, minimum ton lots.

CALCIUM CHLORIDE.—English material unchanged at £5 12s. 6d. per ton ex station; continental prices are rather easier, now quoted £5 2s. 6d. per ton c.i.f. U.K. port.

COPPERAS, GREEN.—Unchanged at about £3 per ton ex works, packed in casks free.

COPPER SULPHATE.—Rather better inquiry. Now quoted £24 per ton f.o.b. U.K. port for export. Continental material on offer at about £23 10s. per ton ex store, spot delivery.

FORMALDEHYDE, 40%.—Spot lots unchanged at about £54 per ton ex store. Offered for prompt shipment from America at £51 per ton c.i.f. U.K. port.

GLAUBER SALTS.—English material unchanged at £4 per ton ex store or station. Continental slightly advanced to about £3 15s. per ton c.i.f. U.K. port.

LEAD, RED.—Imported material rather dearer at about £38 10s. per ton ex store.

LEAD, WHITE.—Unchanged at about £41 per ton ex store, spot delivery.

LEAD, ACETATE.—White crystals offered from the continent at about £43 15s. per ton c.i.f. U.K. port. Spot lots on offer at about £46 per ton ex store.

MAGNESITE, CALCINED.—English material now quoted £7 17s. 6d. per ton ex station, prompt delivery.

MAGNESIUM CHLORIDE.—Spot material now quoted £4 per ton ex store. On offer from the continent at about £3 10s. per ton c.i.f. U.K. port.

MAGNESIUM SULPHATE (EPSOM SALTS).—English material quoted £4 15s. per ton ex store, spot delivery. B.P. quality on offer at about £6 5s. per ton ex station.

POTASH CAUSTIC, 88/92%.—Quoted £28 10s. per ton, c.i.f. U.K. port, prompt shipment from the Continent. Spot lots on offer at £29 5s. per ton, ex store.

POTASSIUM BICHROMATE.—Quoted 5½d. per lb. delivered.

POTASSIUM CARBONATE, 96/98%.—Rather cheaper quotations from the Continent. Now on offer at about £22 17s. 6d. per ton, c.i.f. U.K. port. Spot lots quoted £25 5s. per ton, ex store.

POTASSIUM CHLORATE.—Unchanged at about 2¾d. per lb., ex store.

POTASSIUM NITRATE (SALTPETRE).—Unchanged at about £29 per ton ex store, spot delivery. Offered from the Continent at about £26 15s. per ton, c.i.f. U.K. port.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Spot lots quoted 8¼d. per lb., ex store. Offered from the Continent at about 7¼d. per lb., c.i.f. U.K. port.

POTASSIUM PRUSSIATE (YELLOW).—Still in little demand, nominally 7½d. per lb., f.o.b. U.K. port, but could probably be obtained for less.

SODIUM CAUSTIC.—76/77%, £19 7s. 6d. per ton; 70/72%, £17 17s. 6d. per ton; 60/62%, broken, £19 2s. 6d. per ton; 98/99%, powdered, £22 15s. per ton. All ex station spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—Offered from the Continent at £22 7s. 6d. per ton, c.i.f. U.K. port. Spot lots quoted £23 15s per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 3cs. per ton less.

SODIUM BICHROMATE.—English material unchanged at 4¼d. per lb. delivered.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton, ex quay or station. Alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—English material unchanged at £10 per ton, ex station. Continental offered at £9 15s. per ton, ex store, spot delivery. Quoted £8 10s. per ton. c.i.f. U.K. port, prompt shipment. Pea crystals of English manufacture quoted £13 15s. per ton, ex station.

SODIUM NITRATE.—96/98%, refined quality now quoted £13 7s. 6d. per ton, f.o.r. or f.o.b. U.K. port.

SODIUM NITRITE, 100%.—Now quoted £26 per ton, ex store, spot delivery.

SODIUM PRUSSIATE (YELLOW).—In little demand. Quoted 4¼d. per lb., ex station, or f.o.b. U.K. port.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption £3 10s. per ton, carriage paid buyers' station. Good inquiry for export, and price about £3 per ton, f.o.b. U.K. port.

SODIUM SULPHIDE.—60/62% solid, of English manufacture, £14 15s. per ton, ex station; broken, £1 per ton more; flake, £2 per ton more; 60/62%, solid, offered from the Continent at £12 5s. per ton, c.i.f. U.K. port; broken, £1 per ton more; 31/34%, crystals of English manufacture, £9 2s. 6d. per ton, ex station; 30/32%, crystals of Continental manufacture, quoted £8 10s. per ton, c.i.f. U.K. port.

SULPHUR.—Flowers, £10 per ton; roll, £9 per ton; rock, £9 per ton; ground, £8 per ton. Prices nominal.

ZINC CHLORIDE.—98/100%, solid, offered from the Continent at £24 15s. per ton, c.i.f. U.K. port. English material quoted £27 10s., f.o.b. U.K. port.

ZINC SULPHATE.—Unchanged at about £13 10s. per ton, ex station, prompt delivery. On offer from the Continent at about £11 2s. 6d. per ton, c.i.f. U.K. port.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

DIPHENYLAMINE.—Limited inquiry, price 2s. 10d. to 3s. per lb., according to quantity.

FREUND'S ACID.—Some home inquiry, price 5s. 2d. lb., 100% basis, carriage paid.

MONOETHYL ORTHOTOLUIDINE.—Some export inquiry, price 6s. 3d. per lb., f.o.b.

MONOCHLORBENZOLE.—Supplies are offered at £66 per ton delivered, in returnable drums.

PARA AMIDO ACETANILIDE.—Small inquiry, price 5s. 2d. lb, 100% basis, carriage paid.

PARA PHENYLENE DIAMINE.—Export inquiry, price 10s. 3d. per lb., 100% basis.

S.S. ACID.—Export inquiry, price 12s. per lb., 100% basis, f.o.b.

TOBIAS ACID.—Good export inquiry, price 5s. 2d. per lb., 100% basis, f.o.b.

The Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, July 31, 1924.

The condition of the chemical market here during the past week has been rather varied. Some traders describe business as being rather quiet, whilst others state that a slight improvement in the actual demand during the last few days has been experienced. The average position, I suppose, is much about what it was at last report. As to prices, these have been steady on the whole, but in some instances it is apparent that they have not yet touched bottom, for a further weakening tendency in one or two lines is to be observed.

Heavy Chemicals

Prussiate of soda remains a quiet section of the market and little improvement in the demand for this material can be reported; quotations are still easy at round 4d. per lb. Salt-cake is also rather inactive; for home consumption purposes prices are unchanged at £3 10s. per ton and £3 to £3 5s. for export. Sulphide of sodium is attracting only a limited amount of interest from buyers, though values are fairly steady at £14 10s. per ton for 60–65 per cent. concentrated solid and £9 10s. per ton for crystals. Chlorate of soda continues in quietly steady demand at 2¼d. to 2¾d. per lb. Caustic soda keeps firm at from £16 17s. 6d. per ton for 60 per cent. material to £19 7s. 6d. for 76–77 per cent., a fair amount of business being put through, both on home and foreign account. Glauber salts are quiet but values are still round £3 10s. per ton. Bleaching powder meets with only a moderate inquiry at £10 per ton. Alkali is selling fairly freely at £6 15s. per ton. Hyposulphite of soda is in quiet demand at £14 5s. per ton for photographic crystals and £9 5s. to £9 10s. for commercial. Acetate of soda meets with a moderate amount of inquiry at £23 to £23 10s. per ton. Bichromate of soda is steady and in fair demand at 4¼d. per lb. Phosphate of soda is quiet and a shade easier at about £13 10s. per ton. Bicarbonate of soda is steady but only in quiet demand at £10 10s. per ton. Soda crystals are still quoted at £5 5s. per ton, but sales are rather slow.

The demand both for caustic potash and carbonate of potash is quiet and values are easy, although there has been little perceptible change since last report. Caustic potash is currently quoted at round £29 per ton for 90 per cent. strength, and carbonate at about £22 10s. Permanganate of potash is selling only in moderate quantities at from 6¾d. to 7¼d. per lb., according to quality. The demand for yellow prussiate of potash is slow and values are slightly easier at 7d. to 7¼d. per lb. Chlorate of potash meets with a moderate inquiry at about 2¾d. per lb. Bichromate of potash is steady and in fair demand at 5¼d. per lb.

The demand for arsenic shows little or no improvement although values are little changed from last week; white powdered, Cornish makes, is on offer at about £47 per ton in Manchester. Sales of sulphate of copper are on a small scale, but quotations are fairly steady at £24 5s. to £24 10s. per ton, f.o.b. Commercial Epsom salts are steady and in moderate demand at £4 15s. to £5 per ton; magnesium sulphate, B.P., is on offer at round £6 10s. Acetate of lime is quiet but unchanged at about £18 per ton for grey and £12 10s. for brown. Acetate of lead is still quoted at £46 to £47 per ton for white and £45 for brown, but the demand is rather slow. Nitrate of lead is on offer at about £42 10s. per ton.

Acids and Tar Products

Tartaric and citric acids are in quietly steady demand at 1s. 1d. to 1s. 1¼d. and 1s. 5¼d. to 1s. 6d. per lb. respectively. Acetic acid is also in moderate inquiry at about £46 for 80 per cent. commercial and £70 for glacial. Oxalic acid is still very quiet at about 4¼d. per lb.

Actual business in pitch is slow although a fair inquiry for next season's shipment is now developing; the current quotation is about £3 per ton, though it is largely nominal. Carbolic acid is quiet and easy at 6¼d. to 6½d. per lb. for crystal and 1s. 9d. to 2s. per gallon for crude. Naphthalenes are inactive at £16 10s. per ton for refined and £5 and upwards for crude. Solvent naphtha is a shade better at round 1s. 4d. per gallon. Cresylic acid is well held at 2s. 2d. per gallon. Creosote oil meets with a moderate inquiry at about 6d. per gallon.

Company News

Dartmoor China Clay Co.—The net profits for the year 1923 were £23, which reduces the adverse balance brought forward to £2,689.

International Paint and Compositions Co.—The directors have declared an interim dividend of 2 per cent., less tax, on the ordinary shares, payable on August 30.

Gas Light and Coke Co.—The directors have declared dividends for the half year ended June 30 last on the 4 per cent. consolidated preference stock at the rate of 4 per cent. per annum, on the 3½ per cent. maximum stock at the rate of 3½ per cent., and on the ordinary stock £5 6s. 8d. per cent. per annum.

British Oil and Cake Mills, Ltd.—The directors announce that, while the trading for the past six months has resulted in a profit, they have decided to postpone the consideration of an ordinary share dividend until the accounts are closed at the end of the year. Twelve months ago there was an interim distribution of 5 per cent., less tax.

Anglo-Continental Guano Works.—The report for the year ended December 31 last states that the net profit, after providing for all trade charges, directors' fees, etc., amounts to £9,924, which, with the balance brought forward, makes a total of £15,320. After payment of debenture interest and dividend on the preference shares for the half-year ended June 30, 1923, there is a debit balance of £5,360 to be carried forward.

Tariff Changes

Basutoland, Bechuanaland and Swaziland.—Dumping duties are to be imposed on certain imported superphosphates.

Bolivia.—Export duties on silver, lead, tin, and antimony have been revised.

Lithuania.—Import duties on matches, spirit varnishes and green soap (liquid) have been increased.

Sweden.—Considerable amendments are recorded in connection with the importation of products containing alcohol.

New Paint and Tar Products

It is stated that Mr. Thomas King produced from a tar basis a permanent solid paint, of pure black or any darkish tint, which is claimed to be absolutely acid and alkali proof, unaffected by fresh or salt water, unaffected by any temperature between zero and 500° Fahr., able to be rendered quite non-inflammable, and cheaper to produce than any other paint now in use.

Mr. King has also discovered a binding composition for road making, which is unaffected by heat, and the road surface does not become soft as is the case with ordinary tarred roads.

Another by-product is a colourless liquid with which any kind of inflammable material can be treated, rendering it non-inflammable. These and other products have already been brought to the notice of the Admiralty, the War Office, and other Government Departments and other authorities.

Helium Purification Plant

The helium purification plant at Lakehurst, U.S.A., which has been completed by the Bureau of Mines and successfully operated by the Navy, is being formally turned over to the Navy. The cost of the plant was about $100,000, and it has a capacity of about 200,000 cubic feet in 24 hours. It has been proved to operate up to capacity, producing helium of a purity of 98 per cent. at a cost of about one dollar per thousand cubic feet. It was originally designed to purify helium where the purity had been reduced to 85 per cent. by diffusion into the bag, but it has been found that it will operate on a mixture as low as 40 per cent. helium without reducing the capacity of the gas being processed and without reducing the purity obtained.

Interest in Chemicals at Wembley

Interest in the Chemical Section at Wembley by the general public is decidedly increasing, and a greater proportion of visitors is penetrating behind the stands fronting the main avenue to those behind and to the Scientific Section. It is noteworthy also that the interest taken is one of intelligence rather than vacant amazement, which was common a few weeks ago.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

CATALYTIC CHEMICAL CO., LTD., Norwood Wharf, Southall. (C.C., 2/8/24.) £29 6s. 3d. June 19.

LONDON CHEMICAL WORKS, LTD., Scotts Road, Southall, chemical manufacturers. (C.C., 2/8/24.) £27 8s. 2d. April 3.

ROCKCASTLE CHEMICAL CO., 52, Corporation Street, Manchester, chemical manufacturers. (C.C., 2/8/24.) £28 12s. 10d. May 30.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

ASHBY SOAPS, LTD., Derby. (M., 2/8/24.) Registered July 12, £7,500 debentures (filed under sec. 93 (3) of the Companies (Consolidation) Act, 1908), present issue £3,000; general charge.

BOLTON CHEMICAL PLANT MANUFACTURING CO., LTD. (M., 2/8/24.) Registered July 11, £1,000 debenture, to Nancibelle Grant, 390, West End Avenue, New York, U.S.A.; general charge. *Nil. December 20, 1922.

CALLINGTON ARSENIC CO., LTD., St. Ive. (M., 2/8/24.) Registered July 14, £1,000 and further advance debenture, to H. Nye, 20, Downview Road, Worthing, and another; general charge.

RANSON (T. W.), LTD., Manchester, chemical manufacturers. (M., 2/8/24.) Registered July 12, £10,000 debentures (filed under sec. 93 (3) of the Companies (Consolidation) Act, 1908), present issue £5,000; general charge. *Nil. December 18, 1923.

TIPPING (J. D.), LTD., Stockport, manufacturing chemists. (M., 2/8/24.) Registered July 12, transfer of mortgage and further charge securing £400 (being £325 transferred and £75 further charge), to Eliza Jackson, 102, Mottram Road, Broadbottom; charged on 24, Swallow Street, Stockport. *£325. April 14, 1922.

TUDORS MASH AND CO., LTD., London, S.W., paint manufacturers. (M., 2/8/24.) Registered July 9, charge under Land Transfer Acts securing £5,000, to L. Mackenzie, 60, Aldermanbury, E.C., wood broker, and another; charged on 97, Wilton Road, Westminster. *£11,100. February 20, 1924.

TYRER (THOMAS) AND CO., LTD., Stratford, manufacturing chemists. (M., 2/8/24.) Registered July 21, transfer of mortgage and further charge, to Westminster Bank, Ltd. securing £5,000 transferred, an increase in the rate of interest thereon and all other moneys now due or to become due to the Bank charged on Stirling Chemical Works, Abbey Lane, Stratford. *£8,000. December 21, 1923.

New Companies Registered

BRITISH BERGIUS SYNDICATE, LTD., Wellington House, Buckingham Gate, London, S.W.1. Manufacturers of oils and other products obtainable from mineral oils, coal and other bituminous materials, etc. Nominal capital, £25,000 in £1 shares.

GLASS HOUGHTON AND CASTLEFORD COLLIERIES (1924), LTD., 11 and 12, Pall Mall, London, S.W.1. Colliery proprietors; manufacturers of and dealers in chemicals and other preparations, etc. Nominal capital, £650,000 in £1 shares.

GUSH'S ELECTRO-RECTIFICATION SYSTEM (1924), LTD. To acquire, equip, maintain and manage laboratories for the purpose of research, experimental and development work, and to carry on the business of electrical, chemical, mechanical, consulting and general engineers. Nominal capital, £50,000 in 38,000 8 per cent. cumulative preference and 12,000 ordinary shares of £1 each. Solicitors: Amery Parkes and Co., Effingham House, Arundel Street, Strand, London.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CHEMICALS FOR POLAND.—An agent in Warsaw desires to secure the Polish representation of British manufacturers and exporters of alum, sulphide of sodium, beta naphthol, sodium bicarbonate, dextrine, gum arabic and shellac. (Reference No. 152.)

CHEMICALS FOR SWEDEN.—A firm of merchants and commission agents in Stockholm wishes to obtain the representation for Sweden of a British firm manufacturing chemicals for use in the soap-making industry. (Reference No. 154.)

Dominion Scholarships for Research

THE governing body of the Imperial College of Science and Technology were enabled recently by generous donations from Sir Arthur Acland, Bart., and Sir Otto Beit, Bart., to establish a scheme of ten Dominion Scholarships for research work in science, tenable at the college during the academic year 1924–25, open to university graduates in the several Dominions and in India. With the co-operation of the India Office and the Colonial Office respectively, appointments to these scholarships have now been made by the respective Governments to the following, among others:—

INDIA.—Mr. Sarbbanisahay Guha Sircar (Calcutta University), Mr. A. S. Gancean (Madras University). AUSTRALIA: Mr. A. S. Fitzpatrick, M.Sc. (University of Melbourne) (for work in applied chemistry, specially in relation to fuels). CANADA: Mr. Armand Circe, C.E. (Ecole Polytechnic, Montreal); and Mr. R. J. Henry, B.A.Sc. (University of Toronto). NEW ZEALAND: Mr. H. L. Richardson, M.Sc. (Victoria University College, Univeristy of New Zealand) and Mr. H. O. Askew, M.A. (Canterbury College, University of New Zealand). SOUTH AFRICA: Mr. Hans Pirow (for mining engineering) and Mr. Lawrence P. McGuire (for plant physiology).

Sir Gilbert T. Walker, C.S.I., Sc.D., F.R.S., has been appointed Professor of Meteorology at the Imperial College of Science and Technology, at South Kensington, in succession to Sir Napier Shaw, F.R.S., who is retiring on August 31. The new professor, who was Senior Wrangler in 1889, and Fellow of Trinity College, Cambridge, 1891, has recently completed a period of about 20 years' service as Director-General of Indian Observatories.

Cause of Bleaching Powder Explosions

BLEACHING powder has been the cause of many serious accidents by exploding in the cans or drums in which it was packed. An investigation carried out in America of the cause of these explosions, reviewed in *Industrial and Engineering Chemistry*, shows that oxygen is evolved from bleaching powder under ordinary commercial conditions in 12-ounce cans and larger air-tight packages, in quantities sufficient to produce serious explosions. This evolution is caused by oxide of iron with manganese oxides as accelerators, acting upon calcium hypochlorite, calcium chlorate, and perhaps calcium perchlorate. The remedy would appear to be obvious but not too easy to achieve.